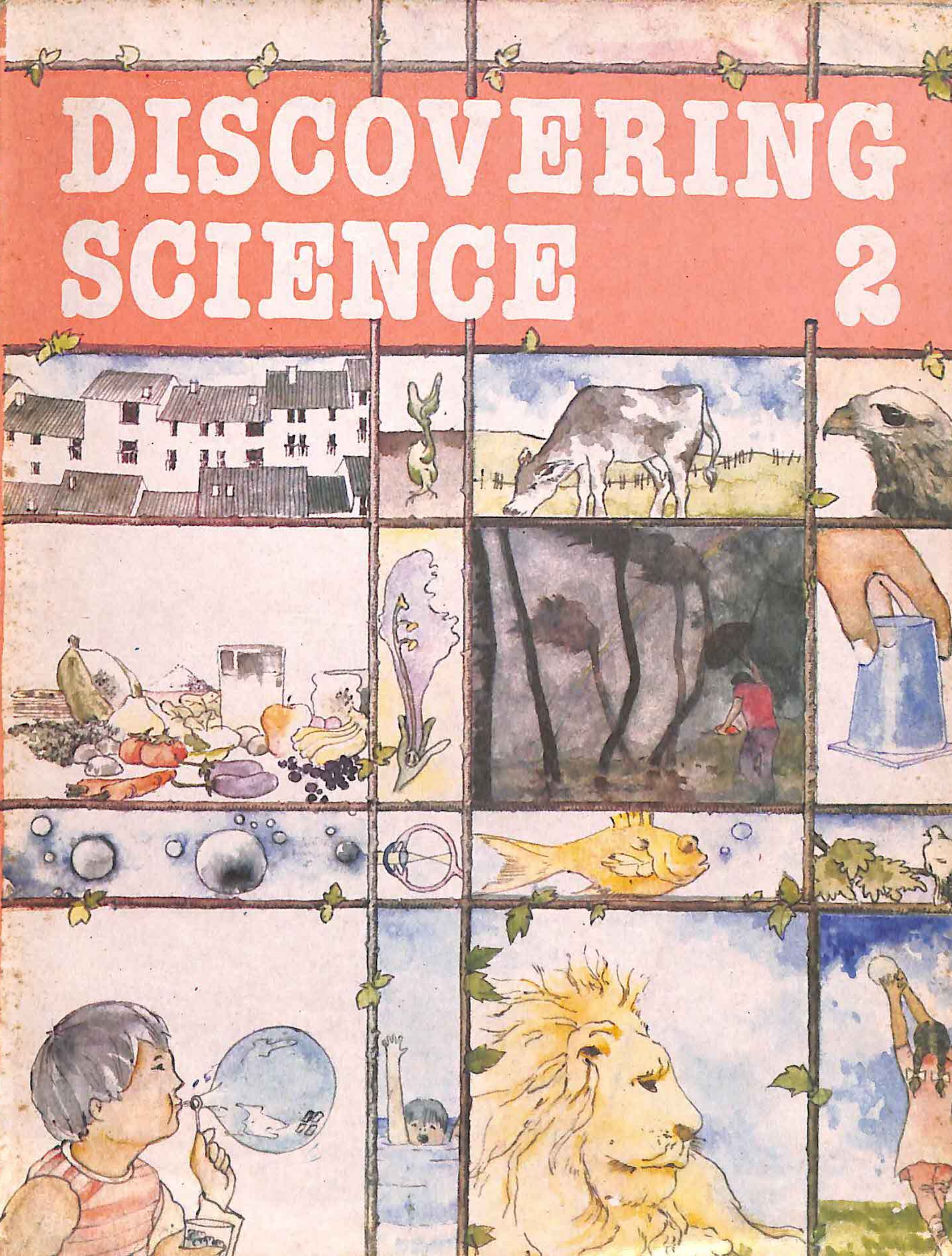
DISCOVERING SCIENCE 2



DISCOVERING SCIENCE

BOOK 2

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SHIREEN JACOB

Sangam Books

NOTE TO THE TEACHER

In the course of writing these books, some decisions have been taken with the recognition that this is a course for the primary level. The terminology and vocabulary must therefore be exact without emotionally distancing the young learner.

With this in mind, some of the vocabulary is 'phased out', e.g. Book 1 uses the term *he-frog* and *she-frog,* and Book 3 introduces the words *male* and *female.*

The teacher's attention is also drawn to the fact that for some plants, fruits and vegetables, the *most* familiar names have been used since there are regional variations. It seemed appropriate, for instance to say *lady's fingers* and *brinjal* instead of *okra* or *aubergine.* Wherever necessary, the teacher is advised to substitute words that are better understood for such words. However, it is also recommended that 'internationally' understood words are introduced at the appropriate level so that they pass into the learner's passive vocabulary.

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PREFACE

Discovering Science offers a new and challenging set of texts which has grown out of modern approaches to learning and teaching science. The five books in the primary series are based chiefly on the syllabus and recommendations of the National Council of Educational Research and Training (NCERT). The books also take into account the syllabuses of other primary-school systems.

The series presents science as the logical, exact discipline it is. The concepts of interdependence and of cause-effect in natural phenomena are clearly established. In the text, as in the exercises, science emerges as knowledge bound up closely with everyday life. A sense of ecology is also developed in a simple manner.

The texts are profusely illustrated, and are planned with a view to stimulating the child's interest and curiosity. The exercises should serve not only to recapitulate what has been learnt, but to create lines for thinking, interpretation, deduction, classification — all of these appropriate to the age-level. Due account has been taken of the possibilities and limitations of the classroom.

The authors and publishers are grateful to the many teachers consulted in the preparation of the books. They are likewise grateful to the artists who have designed and illustrated the books.

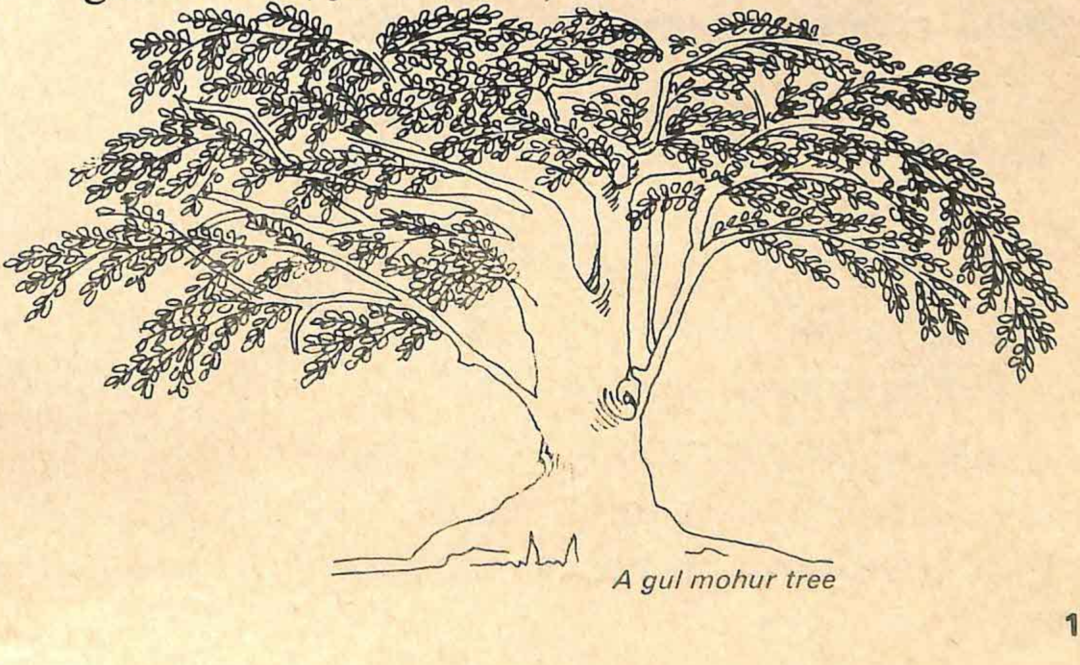
1. Kinds of plants

On your way to school you see many plants. Plants are living things. They produce green leaves, flowers and fruits. Some plants are colourful when their flowers come out.

Some plants grow very tall. We call them trees. Some plants grow bushy. They do not grow very tall. We call them shrubs. There are some plants which do not grow tall. Such plants are called herbs.

Some examples of flowering trees, shrubs and herbs

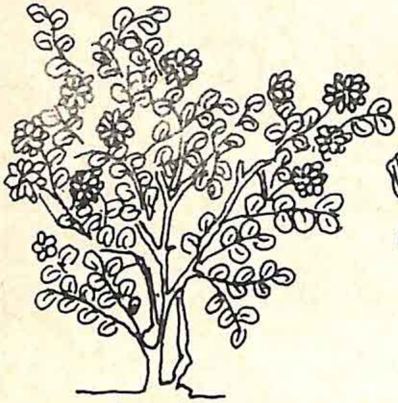
Trees : gul mohur, jacaranda, silk cotton



A gul mohur tree

Shrubs: rose, jasmine, oleander

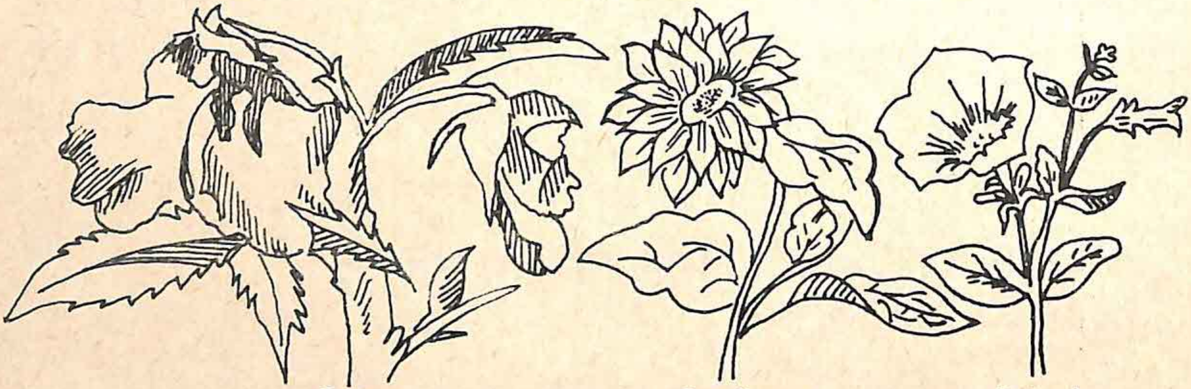
Rose



Jasmine

Oleander

Herbs : balsam, sunflower, petunia

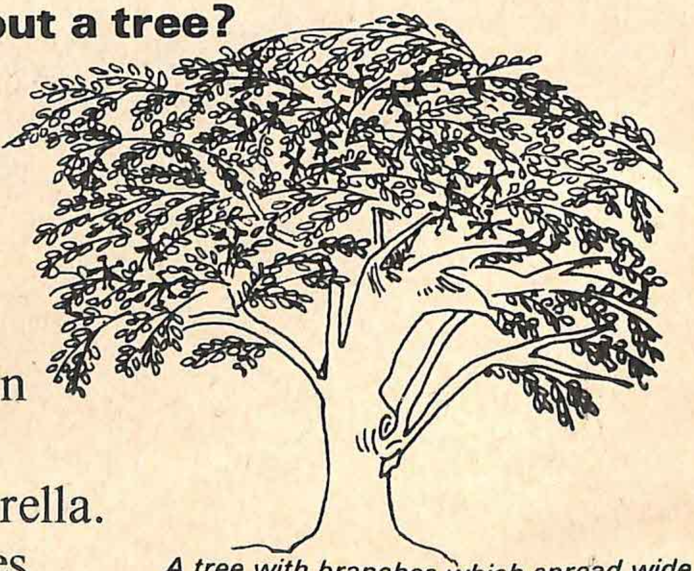


Balsam

Sunflower

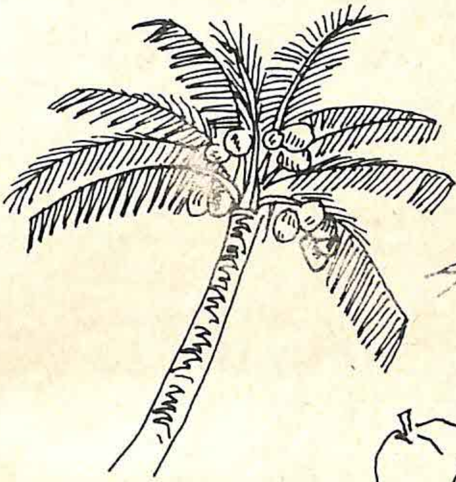
Petunia

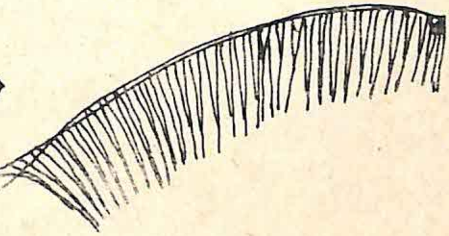
How can you make out a tree?



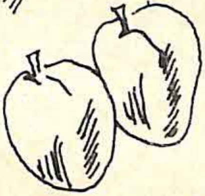
A tree with branches which spread wide

A tree has a huge, woody trunk. Trees like neem, banyan and mango have branches which spread wide. The branches of the rain tree and the gul mohur spread out like an umbrella. Pine trees have branches and are shaped like a cone. Palm trees do not have branches.





A coconut palm



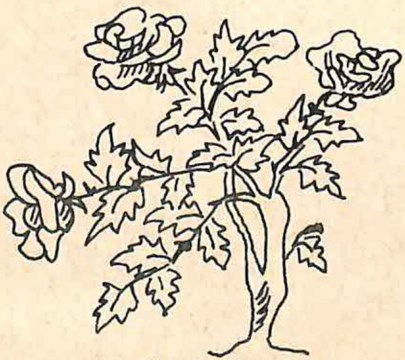
Coconuts

A pine cone

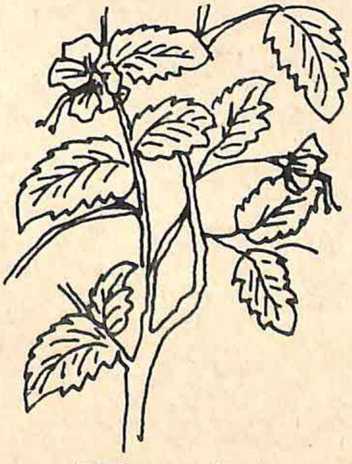
A pine tree

Why are shrubs bushy?

A shrub does not have a trunk. It has many woody stems. Its branches are very closely knit. So they look bushy.



A rose bush

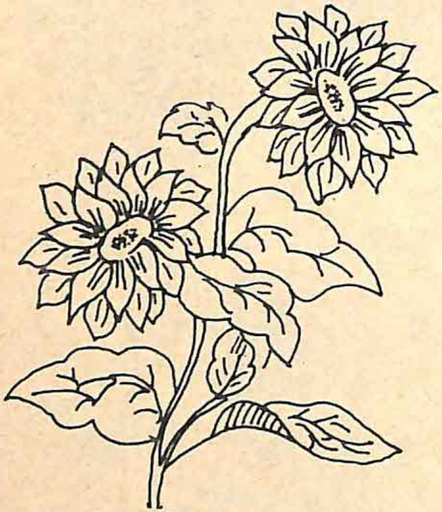


A hibiscus bush

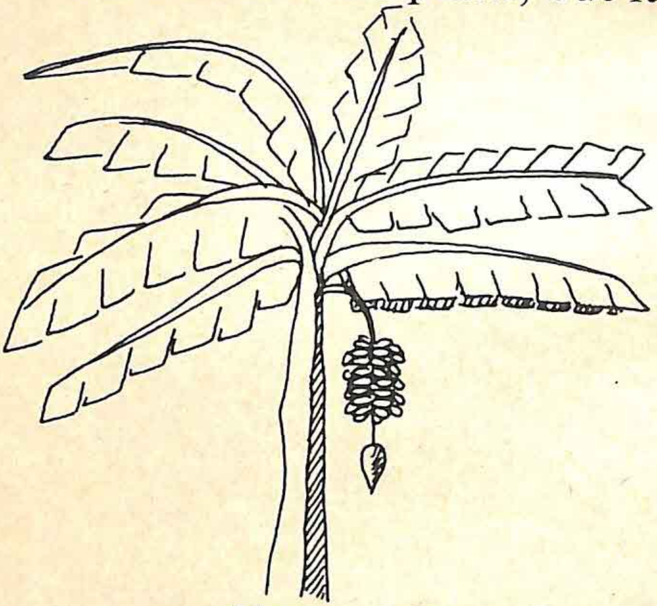
An oleander bush

Are herbs tall or short?

Most herbs are short and do not have a woody stem. The stem of a herb is so soft that we can easily break it. Herbs have branches. The banana is a tall plant, but it is a herb.



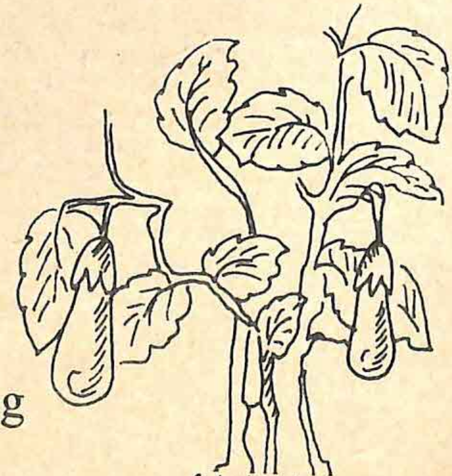
A sunflower plant



A banana plant

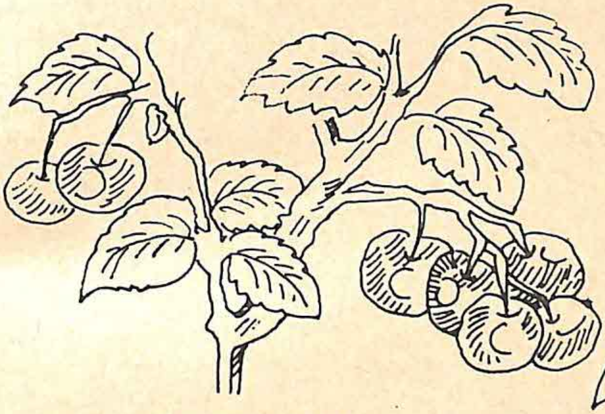
How long do plants live?

Trees live for many years. Shrubs also live for a long time. Herbs live only for a short time. Many herbs live only for one season. Within one season they grow to their full size, produce flowers and fruits. Brinjal, lady's finger and tomato are herbs which live only for one season. They give us vegetables and fruits. Balsam, petunia and sweet pea are flowering herbs. Banyan, mango and neem

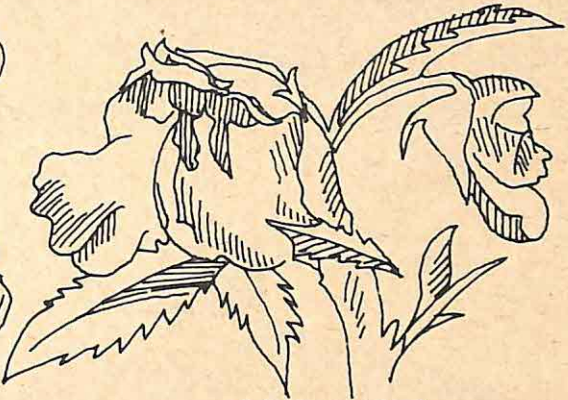


A brinjal plant

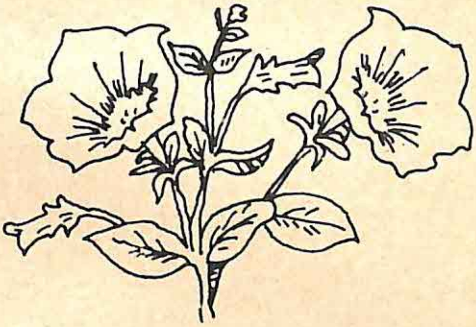
trees grow for many years. They are huge trees.



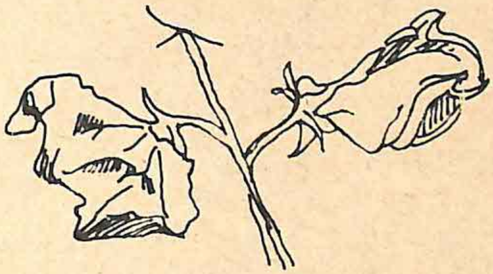
A tomato plant



A balsam plant



A petunia plant



A sweetpea plant

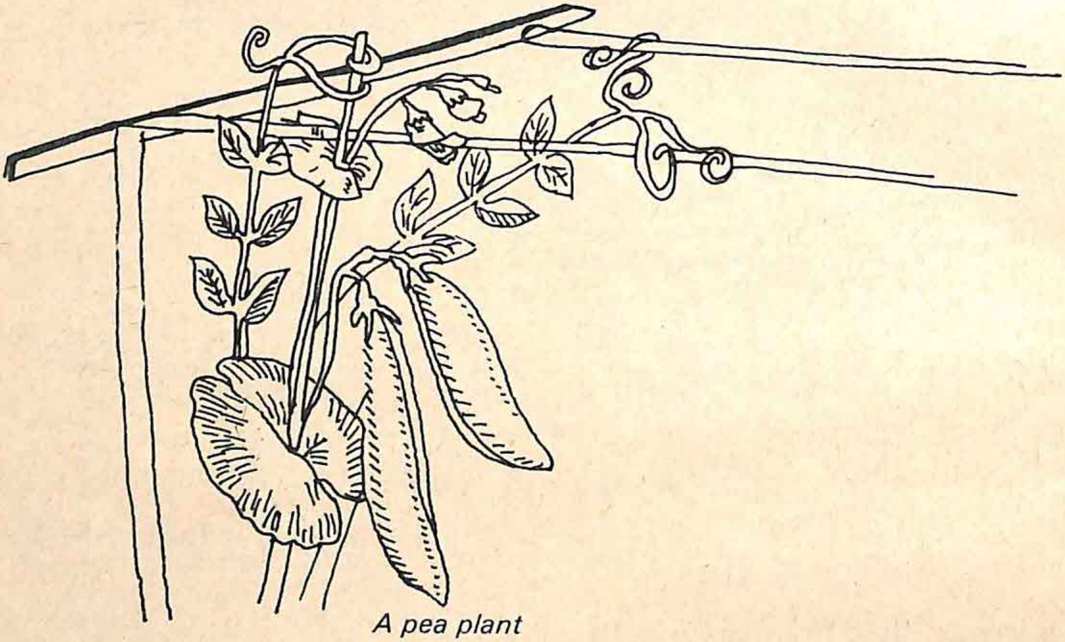
A banyan tree

A mango tree

A neem tree

Do you know?

1. The banana is the tallest of herbs.
2. The redwood tree is the biggest in the world.
3. Morning glory, bean and pea need help for climbing. These plants are climbers.



A pea plant

Things to remember

1. Plants are living things.
2. Trees are tall plants. They have woody trunks. They live for many years.
3. Shrubs are bushy plants. They have many woody stems. They live for a few years.
4. Herbs are short, seasonal plants. Their stems are soft.
5. Climbers are plants with weak stems. They need support.

Things to do

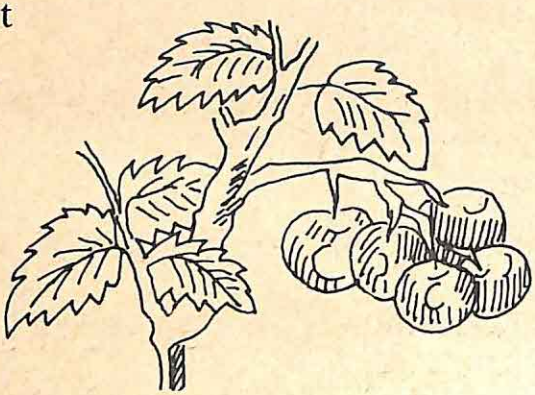
1. Visit a nearby park or garden. Find out which are the herbs, shrubs and trees. With the help of your teacher, learn the names of the plants you see there. Learn to identify them from their
   a. shape, size of stem;
   b. shape and size of leaves;
   c. shape, size and colour of flowers.
2. Press a few flowers and leaves between the folds of a newspaper and place something heavy on it.
3. IN YOUR SCRAP BOOK
   a. Draw the shapes of one or two trees you see there. Label the trees.
   b. Paste the pressed flowers and leaves and label them neatly.
4. IN YOUR SCIENCE NOTE BOOK
   Copy the diagram of any one plant. Colour it neatly, label it and say whether it is a herb, a shrub or a tree.
5. FOR YOUR CLASS DISPLAY BOARD
   Try to draw a large picture of a hibiscus flower and a gulmohur flower along with a leaf each. If you cannot do it, get your friends to help you.

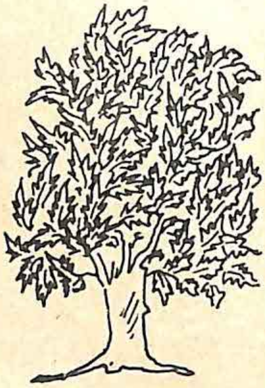
Exercises

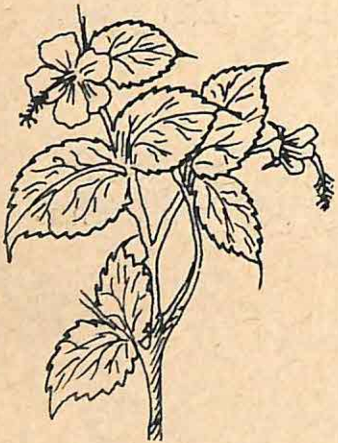
1. Fill in the blanks from the words given below:
   bushy, palm, trunk, cone, gul mohur
   a. A tree has a huge ....
   b. Shrubs are .... plants.
   c. The .... tree is shaped like an umbrella.
   d. .... trees do not have branches.
   e. The pine tree is shaped like a ....
2. Tick the correct answer from the following:
   a. The banana is a herb/tree.
   b. The petunia is a flowering shrub/herb.

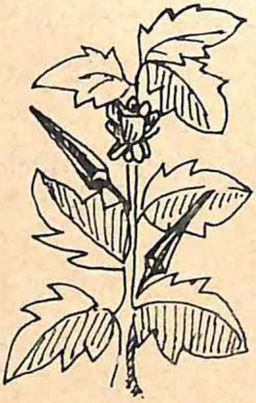
c. The brinjal is a fruit/vegetable.
d. The banyan tree has wide-spreading/short branches.
e. The rose is a herb/shrub.

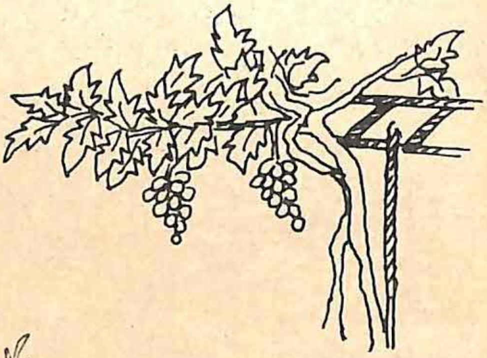
3. Match the names of plants with their pictures:
   - a. lady's finger plant
   - b. sunflower plant
   - c. neem tree
   - d. hibiscus bush
   - e. tomato plant
   - f. morning glory
   - g. grape vine
   - h. bougainvillea

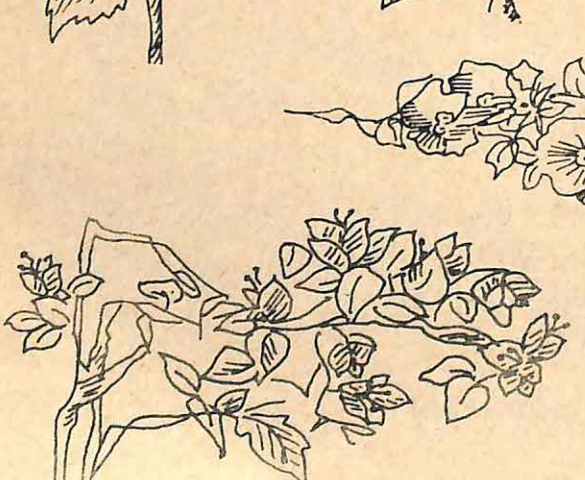


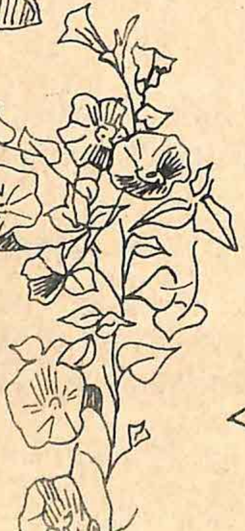


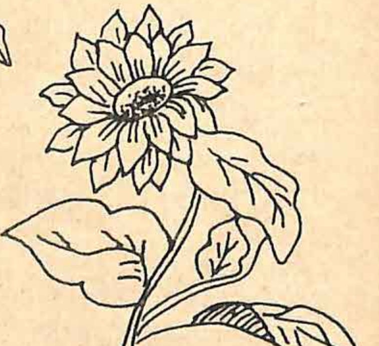








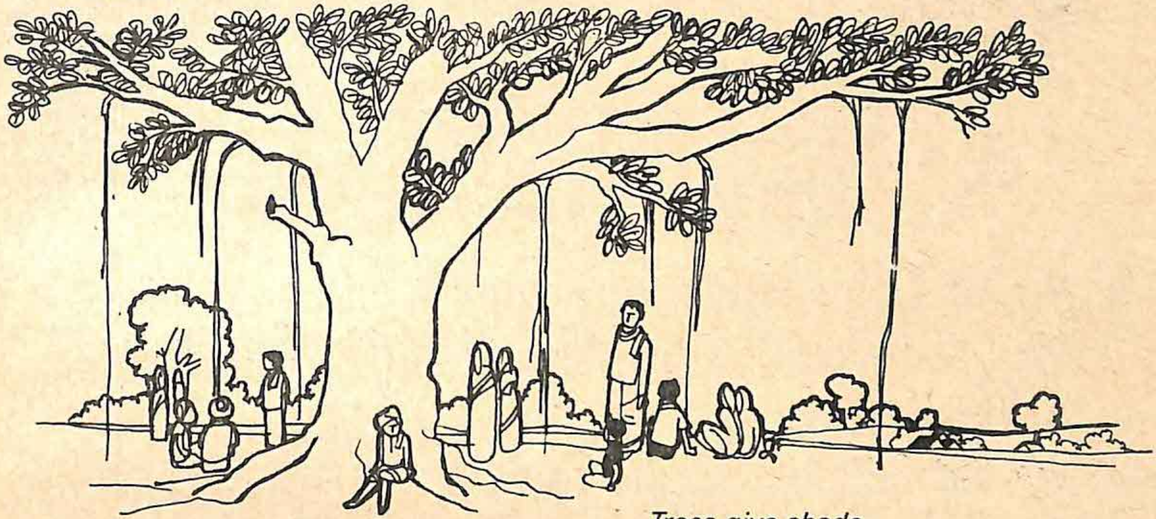




2. Uses of plants

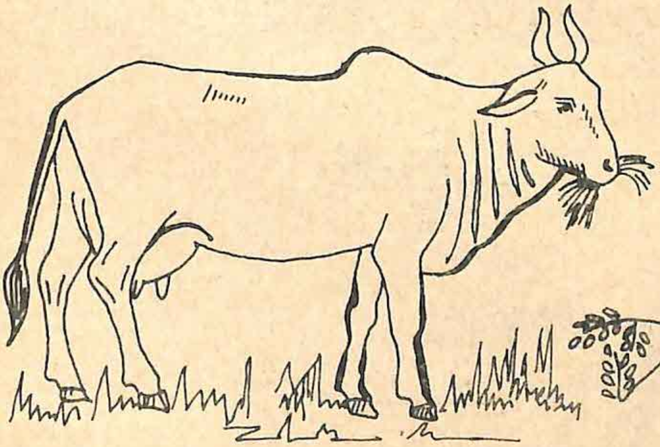
Plants are useful to us in many ways. Let us see how they are useful to us.

1. Big trees like the banyan, asoka and neem give us shade.

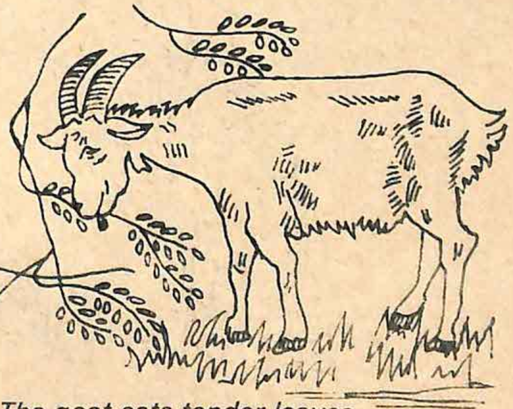


Trees give shade.

2. Plants make the air pure. Later you will learn how.
3. Animals like the goat and deer eat tender leaves. The cow and horse eat grass.



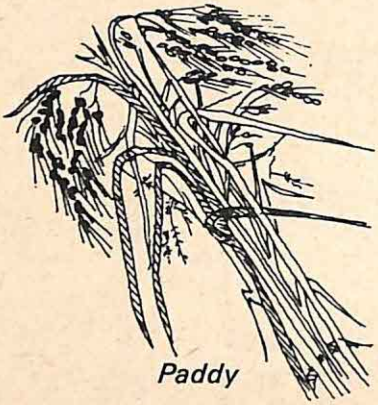
The cow eats grass.



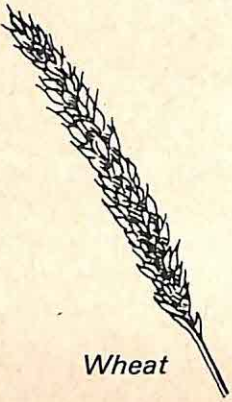
The goat eats tender leaves.

4. We get food grains, fruits, vegetables and nuts from plants.

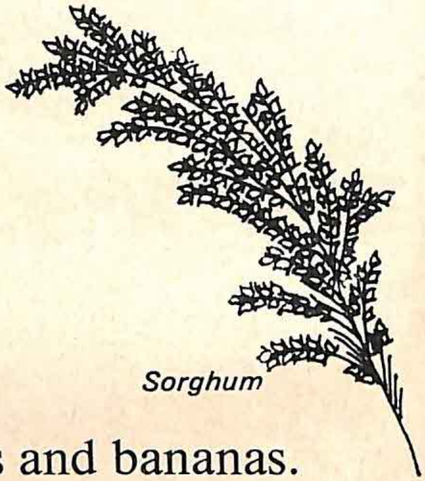
We eat grains like paddy, wheat and sorghum.



Paddy



Wheat

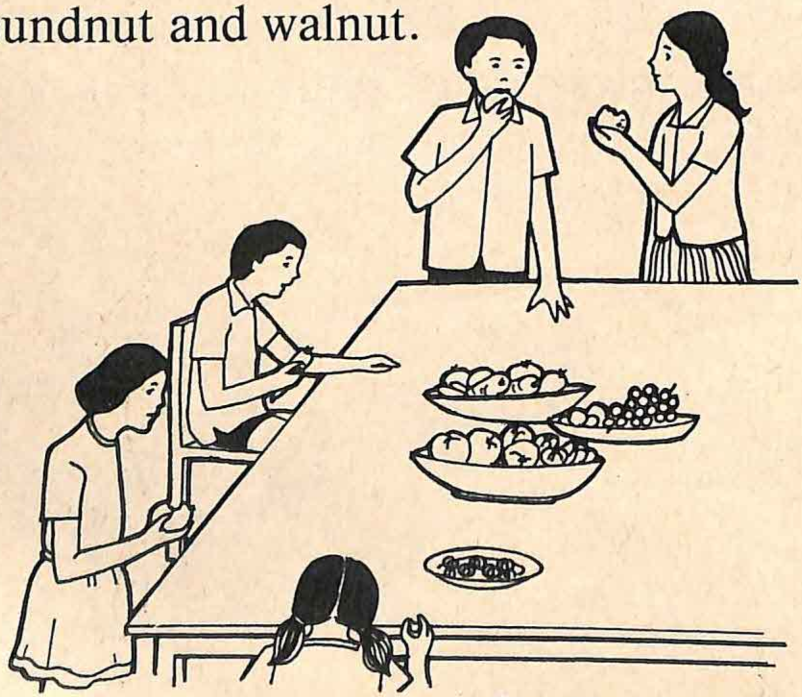


Sorghum

We eat fruits like grapes, apples and bananas.

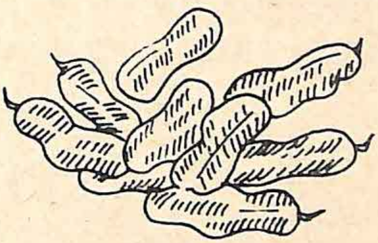
We eat vegetables like brinjal, lady's finger and drumsticks.

We eat nuts like cashewnut, groundnut and walnut.

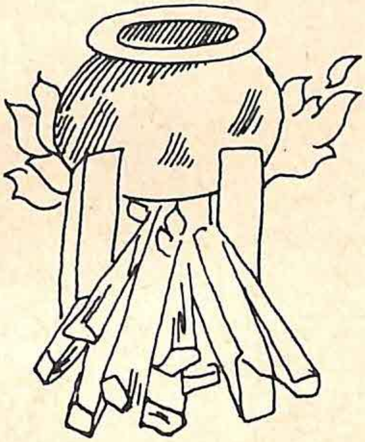


We eat fruits, vegetables and nuts.

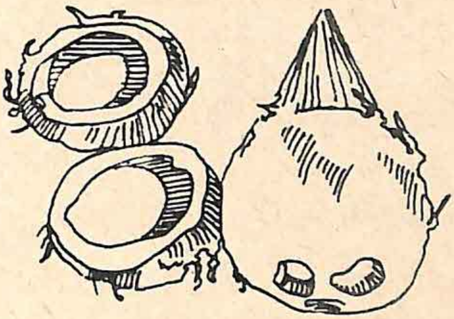
5. We get cooking oil from groundnut and coconut and from the seeds of mustard and sunflower.
6. We use firewood for cooking food.



Groundnuts

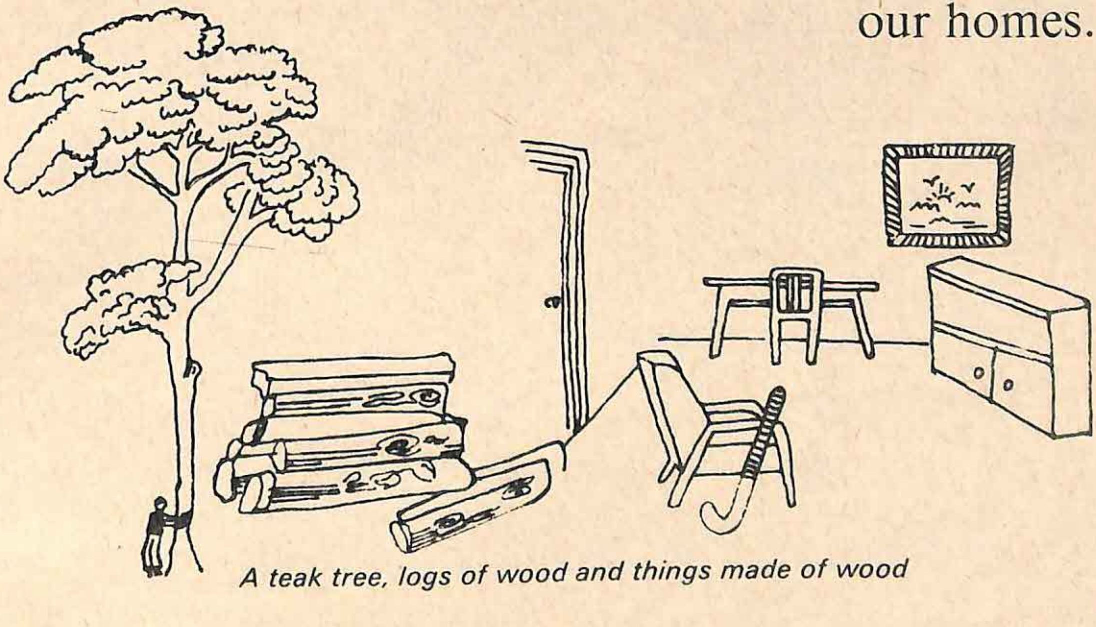


We use firewood for cooking.



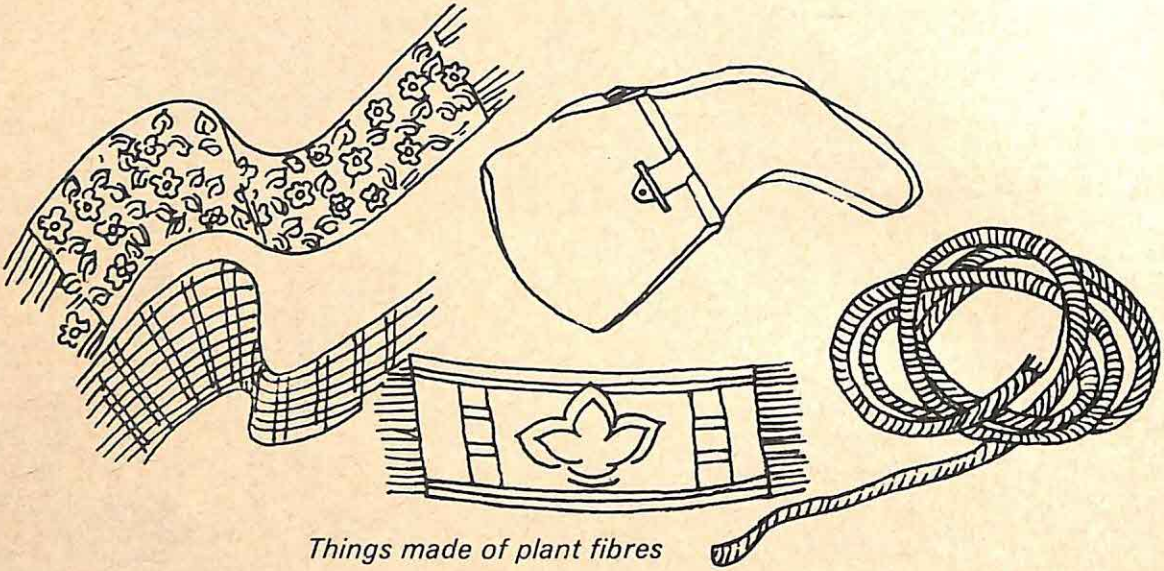
Coconuts

7. Teak, rosewood and mahogany are names of some of the kinds of wood we get from trees. We use them for making furniture, doors and windows for our homes.



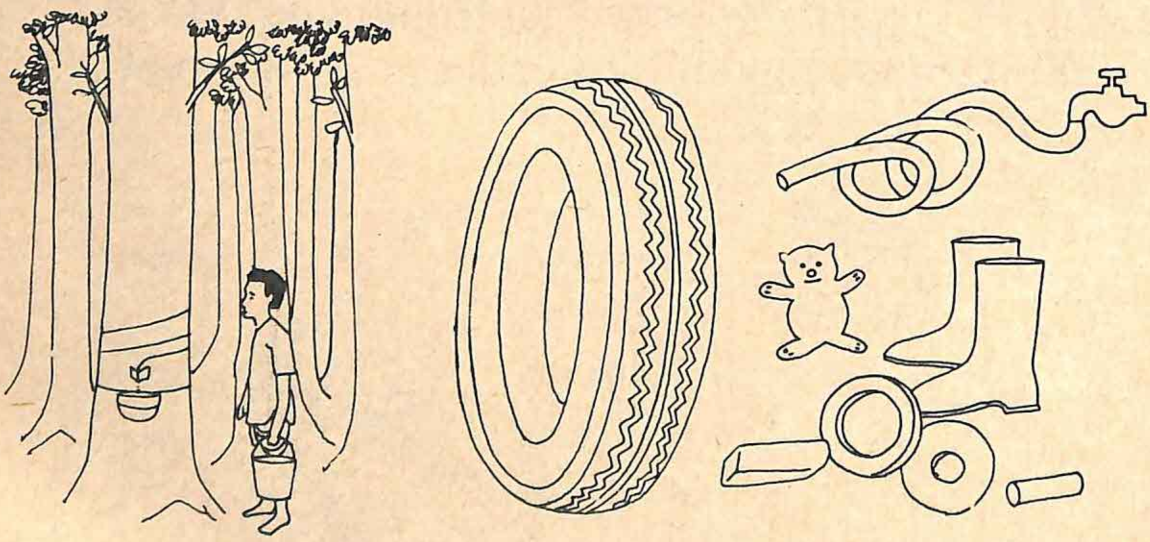
A teak tree, logs of wood and things made of wood

8. We use cotton for making clothes. We also use fibres of flax, hemp and jute for making clothes, and things like mats, bags and ropes.



Things made of plant fibres

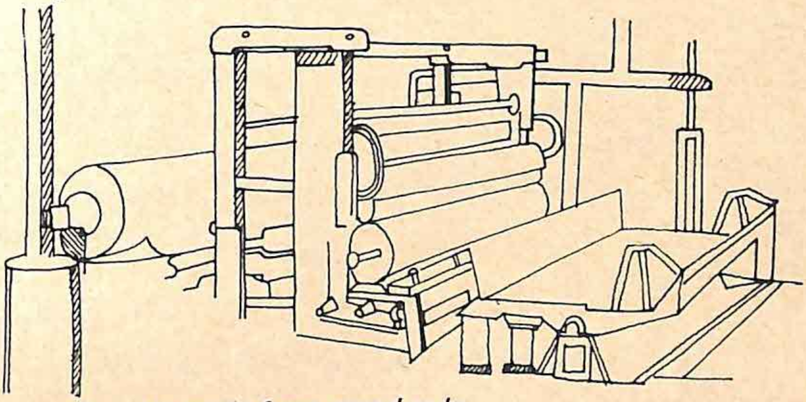
9. We get rubber from the white milk of rubber trees.



Rubber trees and things made of rubber

10. We get gums from acacia and neem trees.

11. We make paper from the pulp of the bamboo and the pine tree.

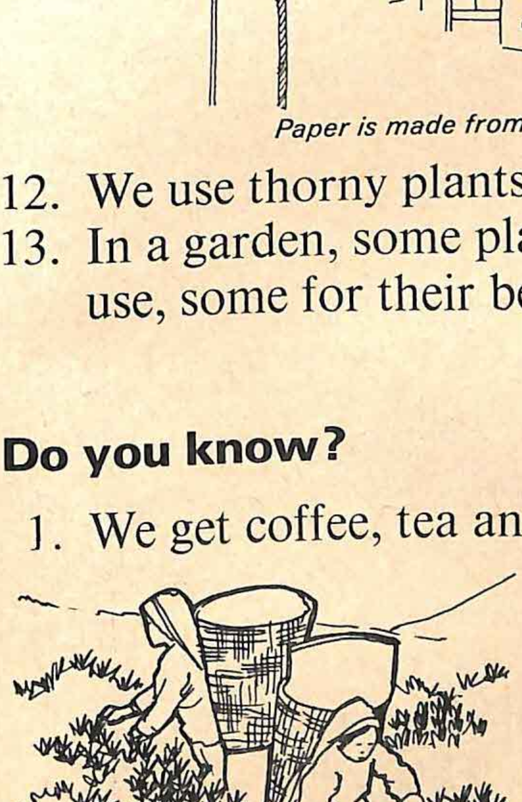


Paper is made from wood pulp.

12. We use thorny plants as hedges.
13. In a garden, some plants are planted for their use, some for their beauty and some for both.

Do you know?

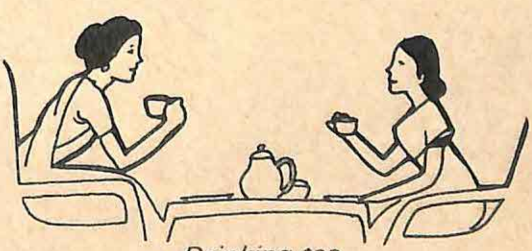
1. We get coffee, tea and cocoa from plants.



Picking tea

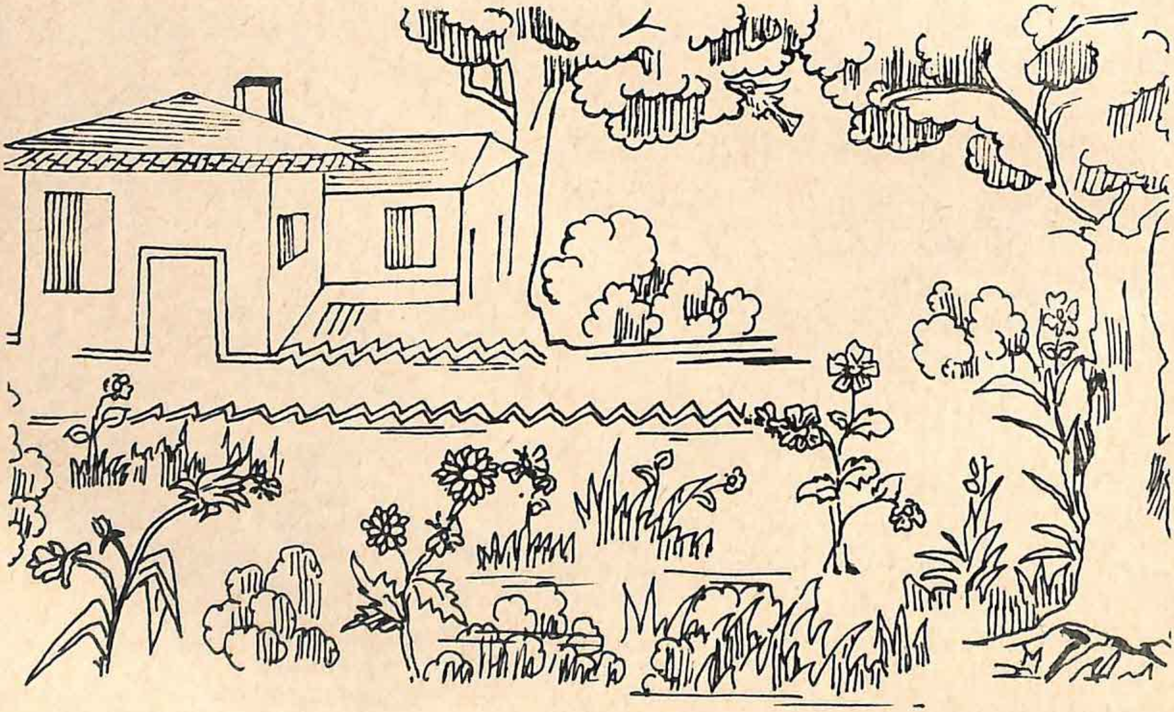
The picked leaf

Making tea

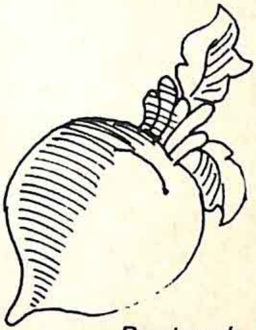


Drinking tea

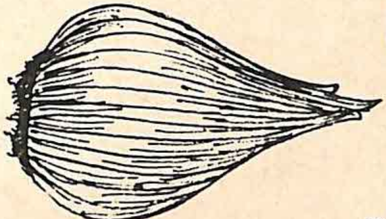
2. Sugarcane and sugarbeet give us sugar.
3. We make perfumes from flowers like rose and jasmine.
4. Bees and butterflies visit flowers for their nectar.
5. We use honey for medicine.
6. We make medicines with eucalyptus, tulsi and ginger.
7. We prepare ink and some dyes from plants.
8. Carrot, turnip, beet and radish are really the fleshy roots of the plants.
9. Ginger and potato are really the fleshy stems.
10. The onion and cabbage we eat are leaves, and, of course, the cauliflower is a flower.



Plants in a garden can be useful and beautiful.

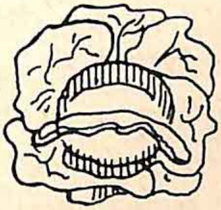


Beetroot

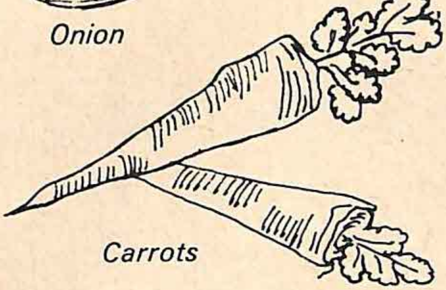


Onion

Cauliflower



Cabbage



Carrots

Turnip

Things to do

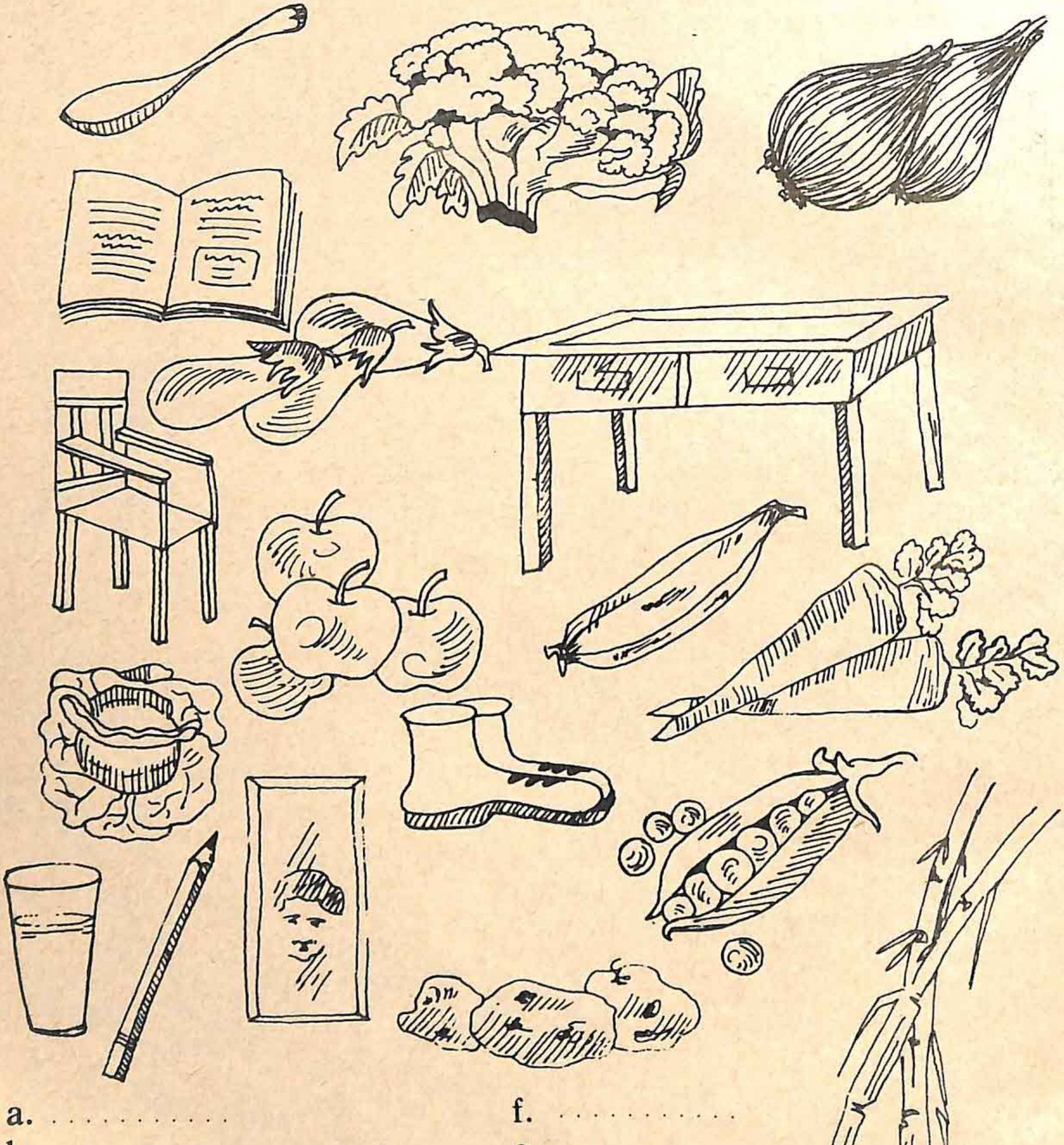
1. IN YOUR NOTE BOOK
   Draw pictures of roots and stems that we eat.
2. FOR YOUR CLASS DISPLAY BOARD
   Collect food grains, oil seeds, seeds of fruits and seeds of vegetables. Put them in tiny plastic bags. Label them neatly. Stitch or pin them up on a cardboard as shown below.

	Food grains	Oil seeds	Seeds of fruits	Seeds of vegetables
a.	—	—	—	—
b.	—	—	—	—
c.	—	—	—	—
d.	—	—	—	—

Hang this on the display board.

Exercises

1. Look at the picture carefully and make a list of things we eat.



a. ....

b. ....

c. ....

d. ....

e. ....

f. ....

g. ....

h. ....

i. ....

j. ....

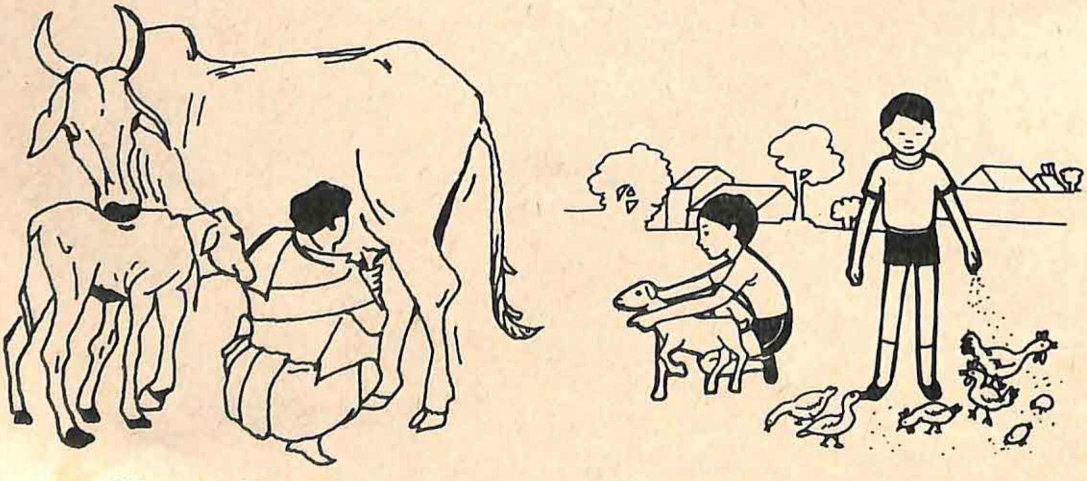
2. Fill in the blanks choosing the correct word from the bracket:
   a. Eucalyptus oil is a .... (medicine, food)
   b. Potato is a .... we eat. (root, stem)
   c. We get cooking oil from .... (coconut, betel nut)
   d. We get .... from hemp. (vegetable, fibre)
   e. .... of pine and bamboo give us paper. (bark, wood-pulp)
   f. .... gives us gum. (acacia, teak)
   g. .... is a food grain. (pea, wheat)
   h. .... tree gives us shade. (neem, palm)
   i. Plants make the air .... (pure, impure)
   j. .... is a root we can eat. (carrot, ginger)
3. Find the odd one out in each group:
   a. mango, apple, orange, sunflower
   b. groundnut, paddy, wheat, maize
   c. cotton, jute, brinjal, hemp
   d. chillie, ginger, pepper, cabbage
   e. teak, mahogany, rubber, rosewood

3. Domestic animals

In and around your home, you see many kinds of animals. Animals are also living things. Unlike plants, animals can move from place to place.

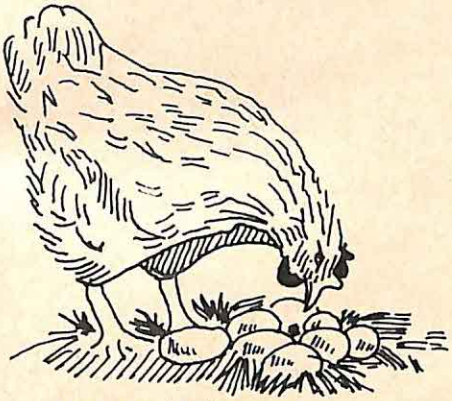
We have learnt to keep some animals as pets in our homes. We give them food and shelter. In return, they give us many useful things and do a lot of work for us. We call such animals domestic animals. How are they useful to us? What work do they do for us?

1. We get milk from the cow, buffalo, goat, camel and the donkey! Cow's milk is used by most of us. Milk is a healthy food for persons of all ages. People who live in deserts drink camel's milk. Donkey's milk is a healthy food that is sometimes used as medicine.

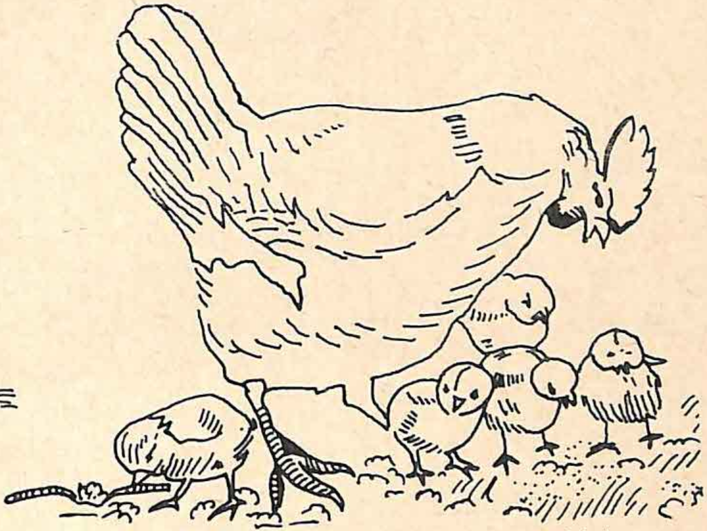


We get milk from the cow and the goat and eggs from hens.

2. We get eggs from birds like hens, ducks, geese and turkeys. Like milk, egg is also a nourishing food. It keeps us healthy and strong.

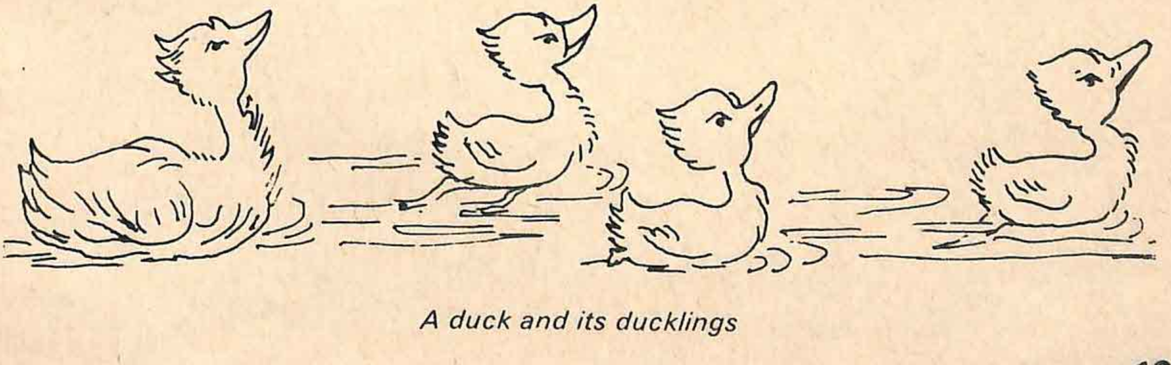


A hen with its eggs



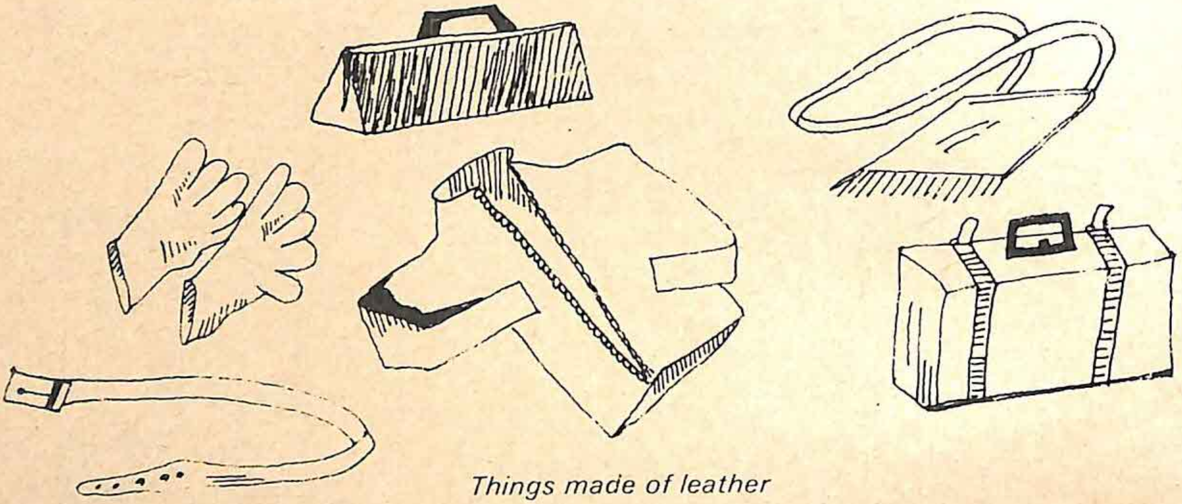
A hen with its chicks

3. We keep some animals for their flesh and meat. We eat the flesh of birds like the chicken, duck, turkey and pigeon.
We also eat the flesh of animals such as the goat, sheep, cattle and pig. We get mutton from goats and sheep. We get beef from cattle. We get pork and ham from pigs.



A duck and its ducklings

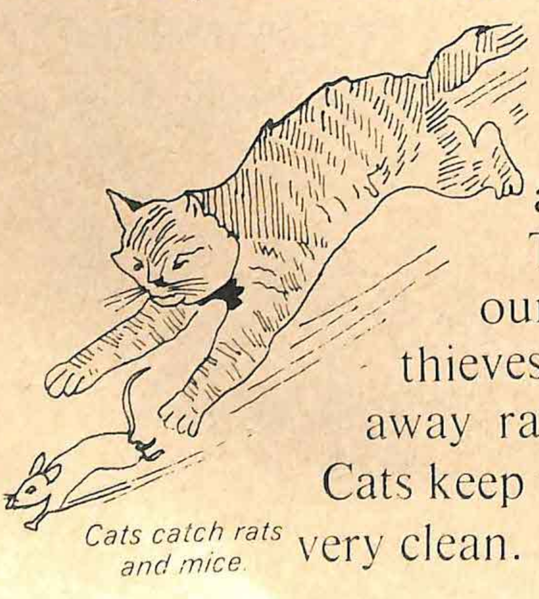
4. We turn the skin of dead animals into leather.



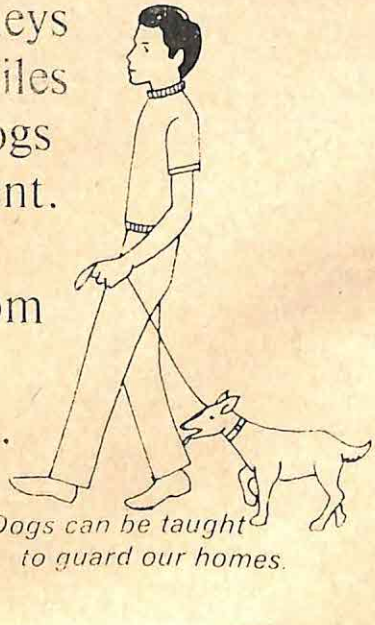
Things made of leather

We use cow and calf leather for shoes, slippers, suitcases, bags, belts and purses. We also make gloves, gum boots and coats out of them.

5. We get wool from sheep. We use the fur of some animals as coats to keep us warm.
6. We keep cats and dogs as pets. Some people keep even monkeys and crocodiles as pets! Dogs are intelligent. They guard our homes from thieves. Cats keep away rats and mice. Cats keep their skin very clean. Have you

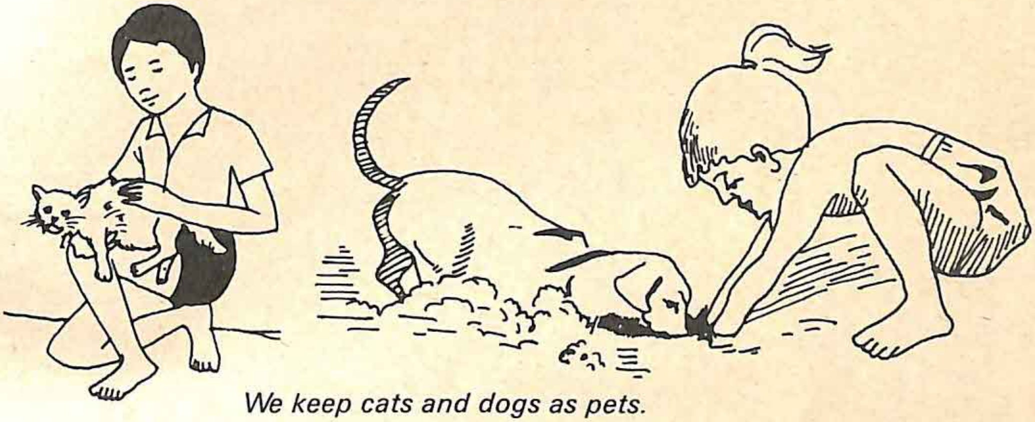


Cats catch rats and mice.



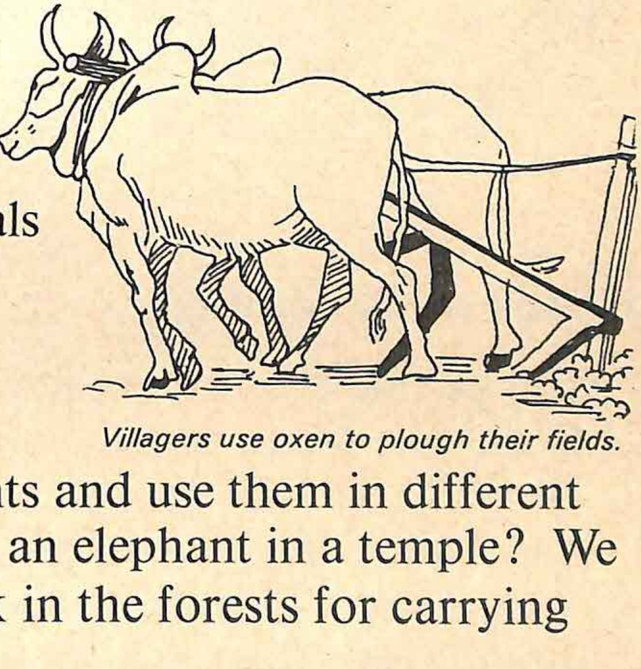
Dogs can be taught to guard our homes.

seen a cat licking its skin?



We keep cats and dogs as pets.

7. Villagers use oxen, donkeys and horses for pulling their carts. They use oxen, buffaloes and even camels for ploughing their fields. As these animals are strong, they use them for carrying heavy loads.



Villagers use oxen to plough their fields.

8. We tame wild elephants and use them in different ways. Have you seen an elephant in a temple? We also make them work in the forests for carrying timber.
9. We collect the dung of animals and use it as manure or fuel.
10. In some villages, people get cooking gas from the dung of farm animals.

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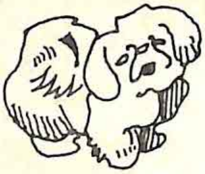
We build these homes for domestic animals

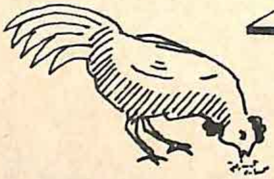
cow — shed
fowl — coop
pig — sty
dog — kennel

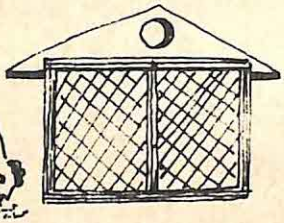
cow

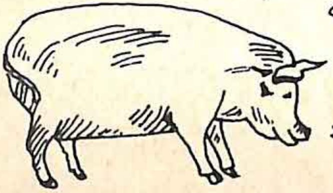
shed

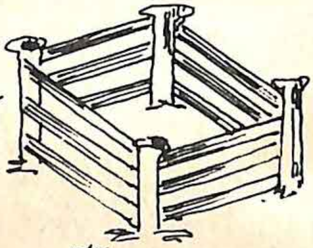

dog

kennel


fowl


coop


pig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Things to remember

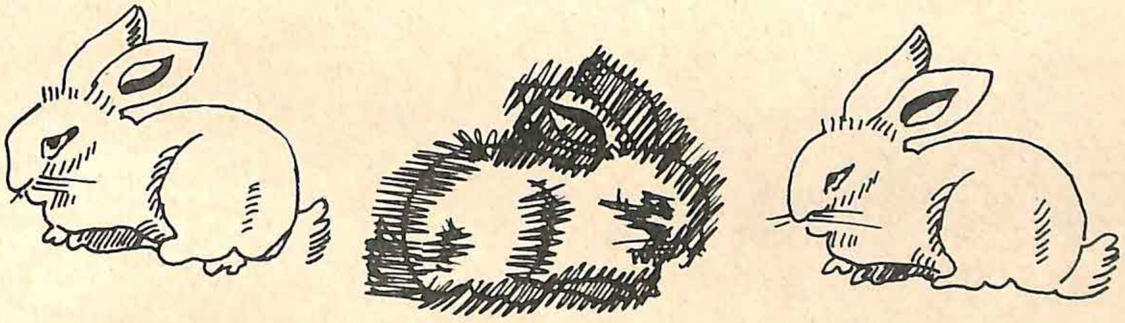
1. Our pet animals live in homes built for them.
2. We fondle them, feed them and take care of them.
3. We get useful things such as milk, eggs, meat, wool and leather from these animals.
4. We use them for pulling carts, for ploughing fields and for carrying heavy loads.

Things to do

1. Visit a nearby poultry and a cattle farm along with your teacher.

See how the animals are fed and taken care of. See how they are sheltered in their homes. Watch how the eggs are collected and the cows milked.

2. IN YOUR NOTE BOOK
   Note down all the information you gather on your visit. Write four sentences about each of the animals you see in your science note book.
3. IN YOUR SCRAP BOOK
   Collect pictures of domestic animals and paste them neatly. Label the pictures.
4. An easy way of drawing animals:
   Trace out the picture of an animal on a thin paper. Shade the lines on the back of the paper. Place it on your note book and run over the outline again. Now you get a thin outline of the animal which you can darken and colour.



Exercises

1. Who am I?
   a. I give milk.
   I have two horns.
   Who am I?
   b. You get wool from me.
   I have short, curved horns.
   Who am I?

c. I lay eggs.
I live in a coop.
Who am I?

d. I carry heavy loads across a desert.
I am the 'ship of the desert'.
Who am I?

e. I have a long trunk.
I carry timber in the forest.
Who am I?

f. I guard my master's house.
I bark at strangers.
Who am I?

g. I kill rats and mice.
I keep my skin very clean.
Who am I?

h. I am very fond of carrots.
I carry bundles of dirty clothes on my back.
Who am I?

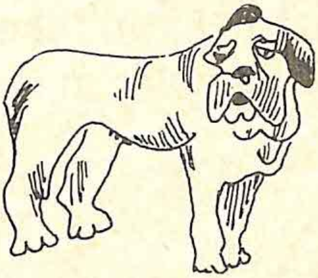
Mark whether true or false:

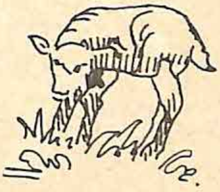
a. Donkey's milk is good medicine. ( )
b. The horse gives us wool. ( )
c. We get beef from deer. ( )
d. Leather is the skin of animals. ( )
e. Cows plough the field. ( )
f. We use the dung of animals as manure. ( )
g. Dogs keep away rats and mice. ( )
h. The cat gives us milk. ( )

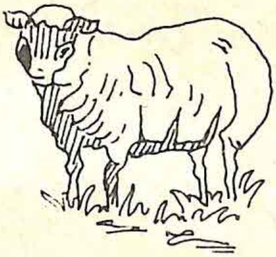
Find the odd one out in each group:

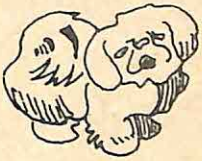
a. cow, buffalo, hen, goat
b. ham, milk, pork, beef
c. chicken, duck, turkey, pig
d. cat, ox, donkey, horse
e. wood, manure, leather, cooking gas
f. kennel, cave, coop, sty
g. shoe, sweater, belt, suitcase

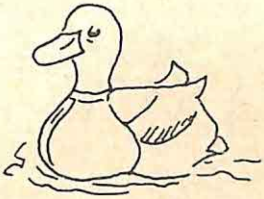
4. Match the mother with her baby.

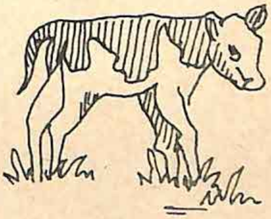


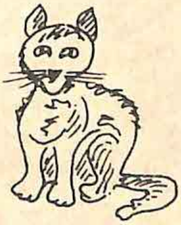


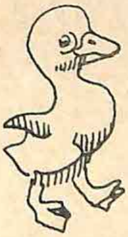


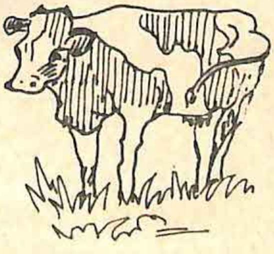


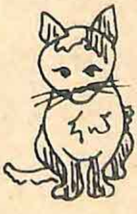












4. Wild animals

Unlike domestic animals, wild animals live on their own. They roam about in forests and jungles in search of food and shelter.

Feeding habits of wild animals

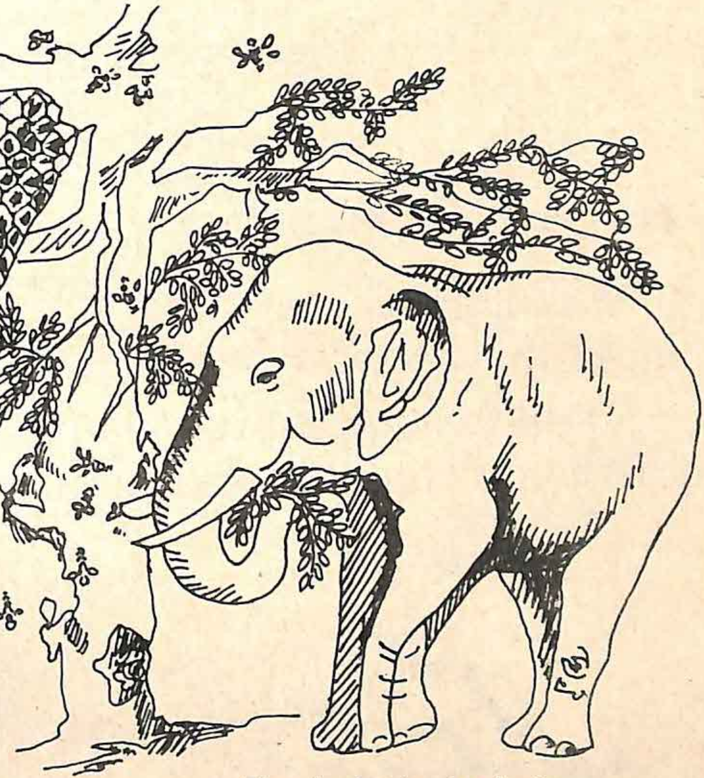
Lions and tigers hunt small animals such as deer and rabbit. They even hunt big animals such as zebra and giraffe for their food.

A lion hunting a giraffe

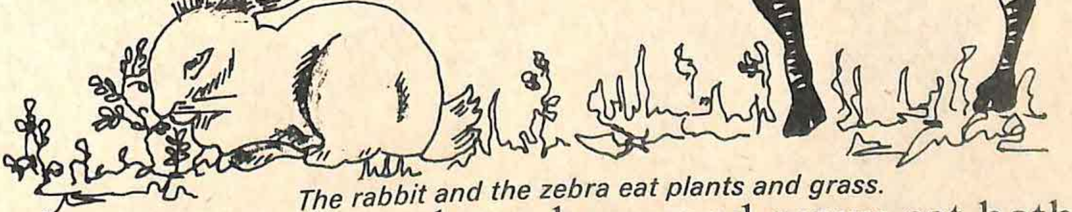
Such animals are flesh eaters. They have sharp teeth for tearing the flesh of their prey. They are also very strong.

The elephant, hippopotamus, rhinoceros, rabbit and deer eat grass and other plants as food. Their teeth are useful for cutting and chewing plant food.

The bear drinks honey.



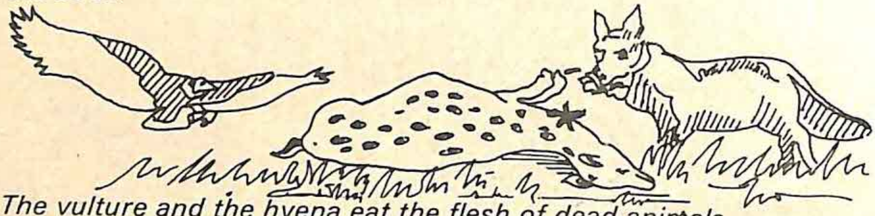
The elephant eats plants.



The rabbit and the zebra eat plants and grass.

Some kinds of monkeys, bears and crows eat both plants and animals as food.

The jackal, hyena and vulture eat the flesh of dead animals. They are scavengers of the forests. They are carrion eaters.



The vulture and the hyena eat the flesh of dead animals.

Homes of wild animals

Wild animals except the burrowing animals, usually never build their own homes.

Lions and tigers live as families in rock caves. We call a lion family "a pride of lions".

A lion's cave

Foxes live in dens.

Elephants, giraffes and deer seek shelter under huge trees.

A fox's den

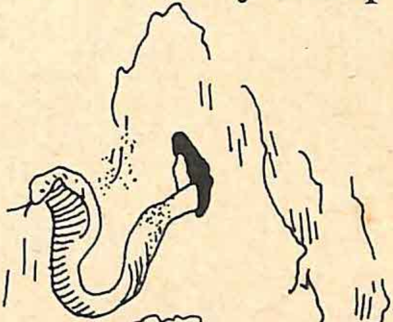
Zebras hide among tall grasses.

The mole, bandicoot, rat and mongoose dig holes in the ground and live in burrows. Moles have very sharp claws for digging.

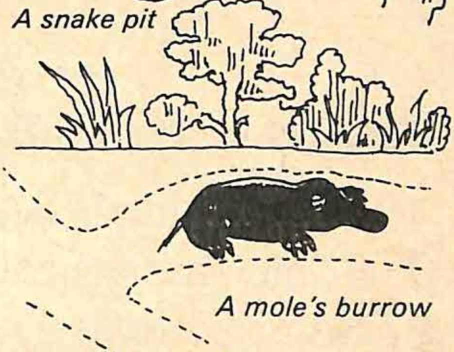
Snakes live in tree holes and in ant hills.

Hares and rabbits live in burrows dug by other animals. A group of such burrows is called a "warren".

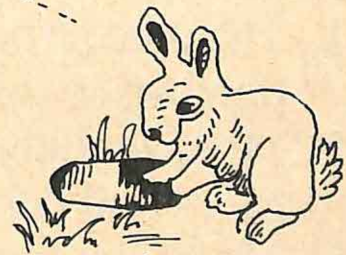
Birds build their own nests on tree branches, in holes of tree trunks, on fields and in gardens.



A snake pit



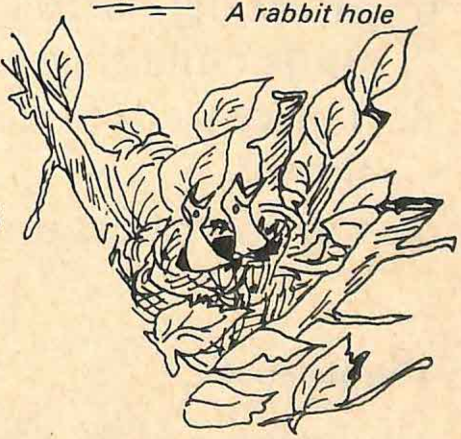
A mole's burrow



A rabbit hole

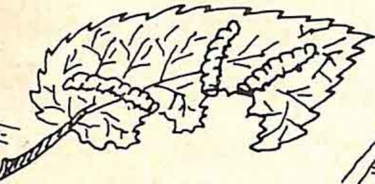
Wild animals are also useful to us

1. We use feathers of birds for making caps and quilts.
2. We get fine silk from the cocoons of silk moths. We make saris and dress materials out of silk.
3. Purses, bags, belts and tents are made from the skins of some wild animals.

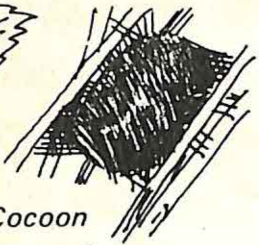


A bird's nest

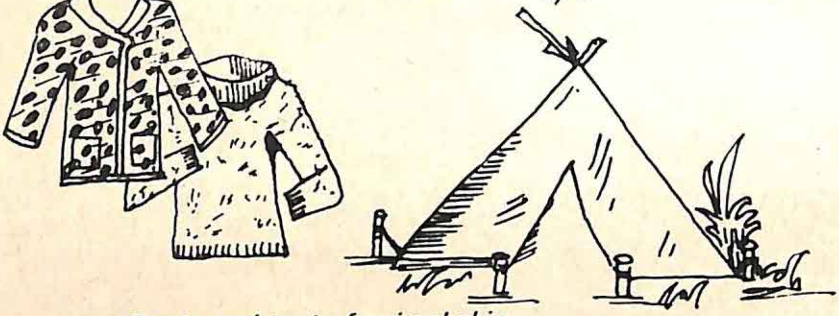
Silk moth



Caterpillars



Cocoon



Coats and tent of animal skin

Things to remember

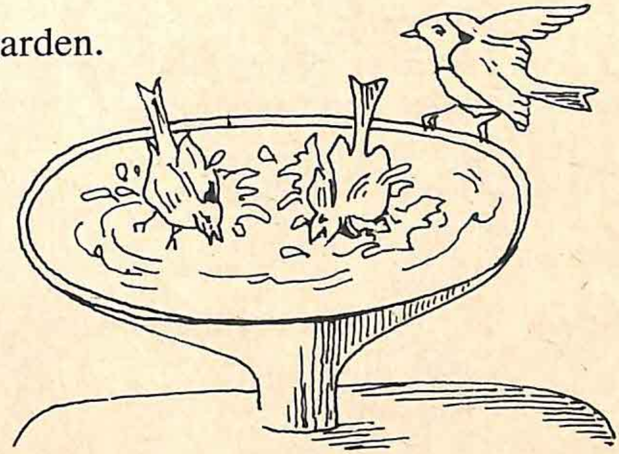
1. Some animals eat flesh.
2. Some animals eat plants.
3. Some animals eat both plant and animal food.
4. The place where we find a number of rabbit burrows is called a warren.
5. Most wild animals live in natural homes such as caves and dens.
6. Moles dig burrows with their sharp claws.
7. Birds build their own nests.
8. The cocoon of the silk moth is made of fine silk thread.
9. Carrion eaters are the scavengers of the forest.

Things to do

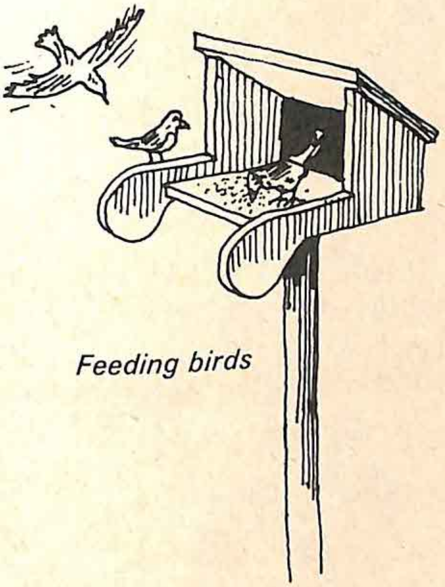
1. Watch a crow or a sparrow building its nest. Find out what

materials they collect for building their nests. Note them down in your note book.

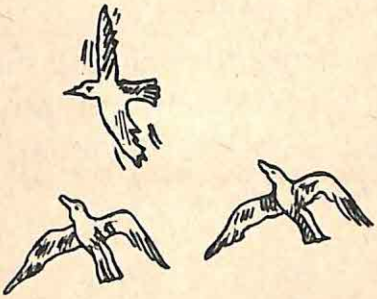
2. Have a bird bath in your garden. Watch the number of birds that come there to have a bath.
3. Set up a bird table to attract bird visitors. Feed them regularly.



A bird bath



Feeding birds



Exercises

1. Who am I?
   a. I have a long neck and long legs.
   I run very fast.
   Who am I?
   b. I have dark stripes on my yellow body.
   I have sharp teeth for tearing flesh.
   Who am I?
   c. I have dark patches on my body.
   I can climb on trees and pounce on my prey.
   Who am I?

d. I am the king of the forest.
I have a mane.
Who am I?

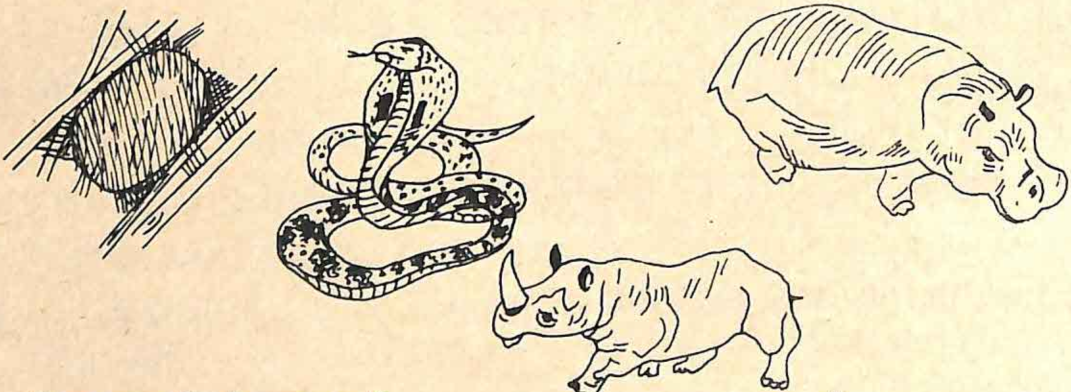
e. I have black and white stripes on my body.
I hide among tall grass.
Who am I?

f. I eat all kinds of food.
I am a bird.
Who am I?

g. I drink honey and also eat flesh.
I can climb trees.
Who am I?

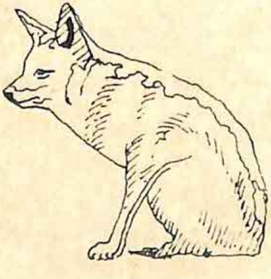
2. Mark whether true or false:

a. The hyena is a carrion eater. (   )
b. The lion eats plants. (   )
c. The polar bear hides among snow. (   )
d. The giraffe finds shelter in the shade of trees. (   )
e. The rabbit can dig its own burrow. (   )

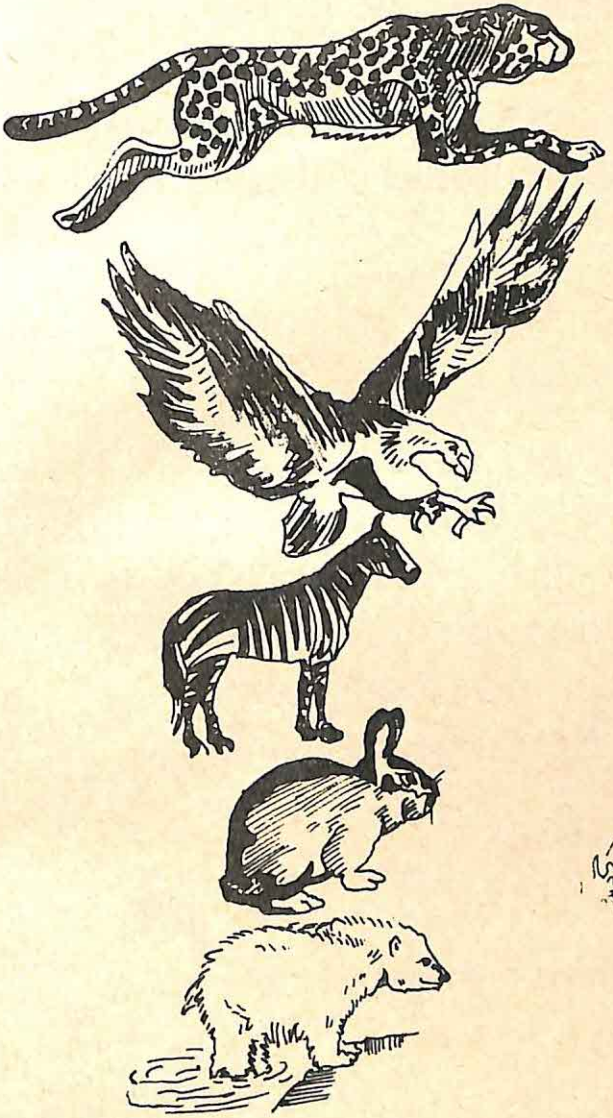


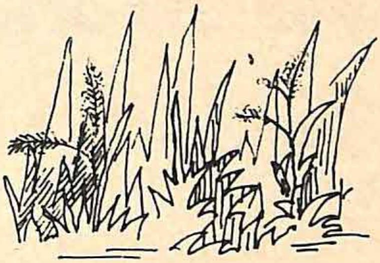
3. Can you find me out?

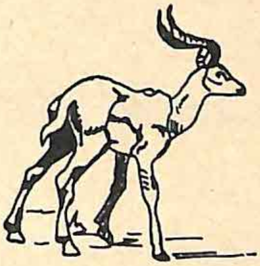
a. S N K E A ....
b. C O N C O O ....
c. H I T A M U S P P O O P.......
d. R H I C E R O S N O ....
e. J A C K L A ....

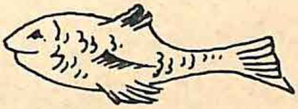


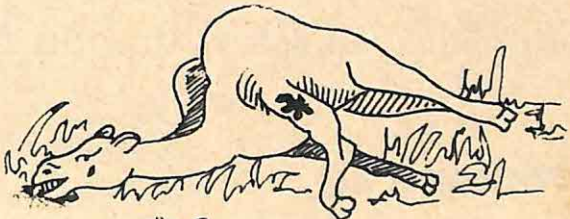
4. Match the animals with the food they eat:

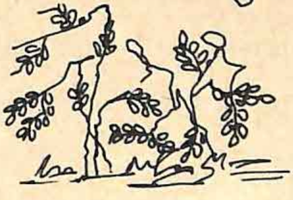












5. The air around us

Air is everywhere. Empty vessels, boxes and bottles are not really empty. They are filled with air. How can you find this out?

Air occupies space

Take an empty bottle. Immerse it in a bucket of water. Tilt the bottle a little so that water can go into it. Now can you hear some sound? What is it due to? What do you see? As water enters into the bottle, bubbles of air escape from it, making a sound.

Thus you know that air fills up empty space.

Moving air

Sometimes the air around us is still. By waving our hand through it, we can feel it.

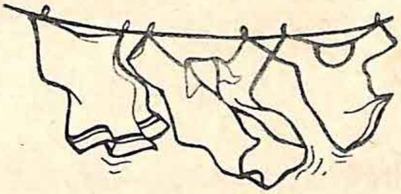
When air moves from place to place it is called wind.

We have other ways of finding out that there is wind.

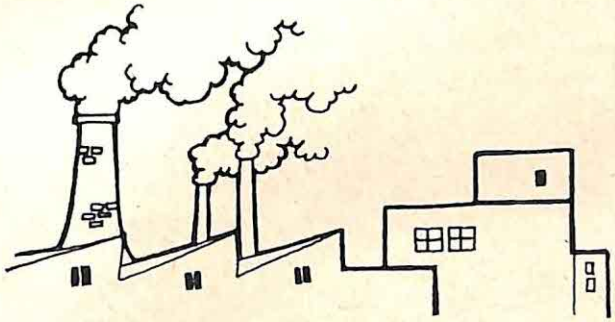
1. Hanging clothes fly in the wind.

Air occupies space.

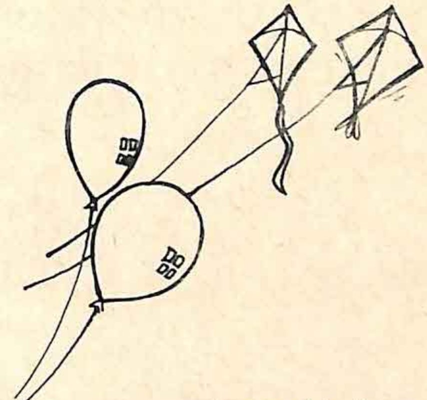
2. Kites and balloons float in the air with the help of the wind.
3. Smoke coming out of a chimney is carried away by the wind.
4. Sail boats sail in the direction of the wind.



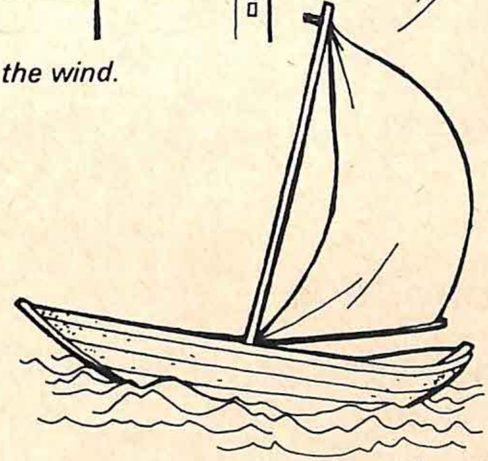
Clothes flutter in the wind.



Smoke is carried away by the wind.



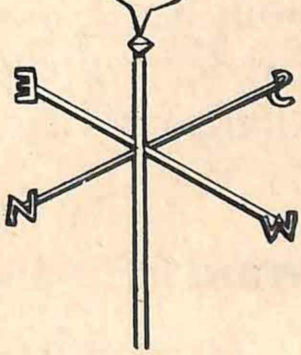
Kites and balloons are held by the wind.



Sail boats sail in the direction of the wind.

Wind has direction

We see sail boats sailing in a particular direction. In airports, we see weather cocks and wind socks showing the direction of the wind. Thus we understand that the wind blows only

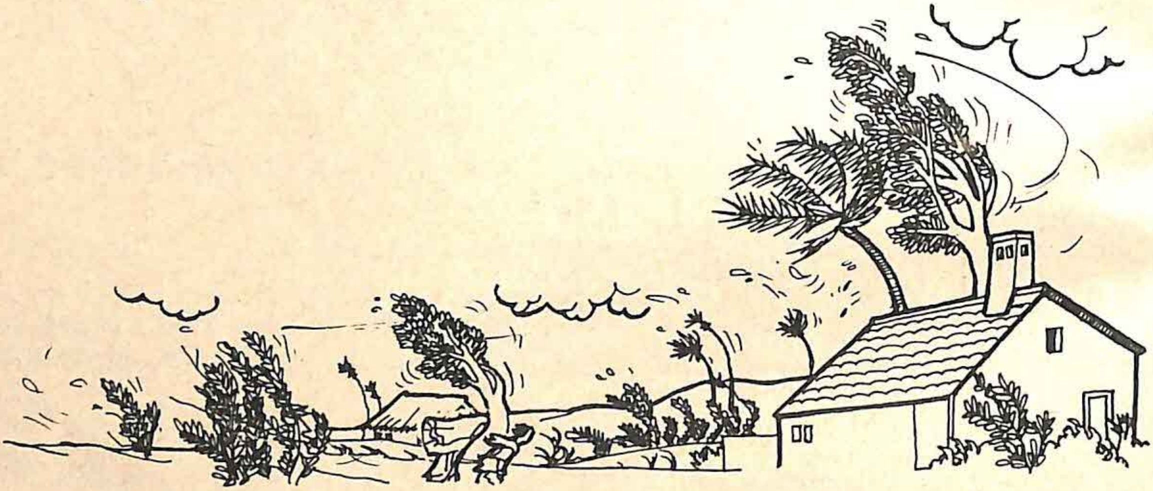


A weather cock

in a particular direction at a time.

Which way does the wind blow?

Hold nylon ribbons high up in the air. You can see that they move in the direction of the wind.



A windy day

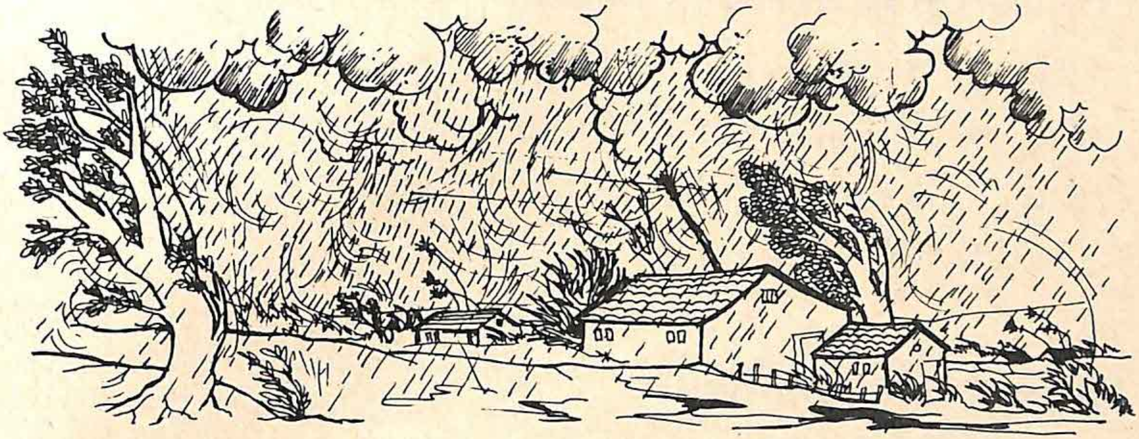
Wind changes direction

Repeat this experiment after sometime. Do the ribbons flutter in the same direction?

Take some sand and drop it little by little, raising your hand. As the sand particles fall down, do they twist and turn? If so, you can understand that wind changes its direction also.

Wind blows with speed

At times wind blows with speed. It tears off paper from your book. It carries away feathers, leaves and even some heavy things, along with it. When it gets stronger, it breaks off tree branches. Sometimes it even uproots huge trees and blows off rooftops.



A stormy day

Thus wind can blow at a very great speed, causing a storm.

Wind exerts force

Walk on the road in the direction of the wind. Then walk the same distance against the wind. Which is easier? Why?

You find that moving in the direction of the wind is easier than moving against it. Thus you know that wind exerts force.

Storm is harmful

A storm causes great damage to telegraph wires, trees and roofs of houses. Boats and ships overturn in the sea due to storm.

The force of wind is useful

Just as we sail our sail boats using the force of the wind, we can also turn wind mills using the same force. Wind mills are used for pumping water and for grinding corn.

Things to remember

1. Air is everywhere.
2. Air occupies space.
3. Moving air is called wind.
4. Wind has speed and direction.
5. Wind often changes its direction.
6. Wind blows at a very great speed causing a storm.
7. Wind exerts force.
8. We can make use of the force of the wind for sailing boats and for turning wind mills.

Things to do

1. Make a paper kite and find out the direction of the wind using it.
2. Make a pinwheel in your handwork class and see how it turns when the wind blows.
3. Go to the sea shore and watch the sail boats sailing. Note that the

sails are not used when the air is still.

4. Visit a farm where a windmill is set up. See how it works.
5. IN YOUR NOTE BOOK

   Draw the following scenes:

   a. A windy day.
   b. A stormy day.
   c. A scene at an airport with the weather cock and wind sock showing the direction of the wind.

Exercises

1. Tick the correct answer:

   a. When we dip an empty bottle in water, air bubbles (rise up/move down) from the bottle.
   b. The force of the wind turns a (wind mill/flour mill).
   c. Ribbons fly (against/in the direction of) the wind.
   d. A wind sock is found in (an airport/a railway station).
   e. A fisherman (uses/does not use) the sail, when the air is still.

2. Match the following:

a. stormy day	shows direction of the wind
b. windy day	uprooted trees
c. weather cock	in the direction of the wind
d. easy pedalling of bicycle	against the direction of the wind
e. hard pedalling of bicycle	children fly kites

6. Contents of air

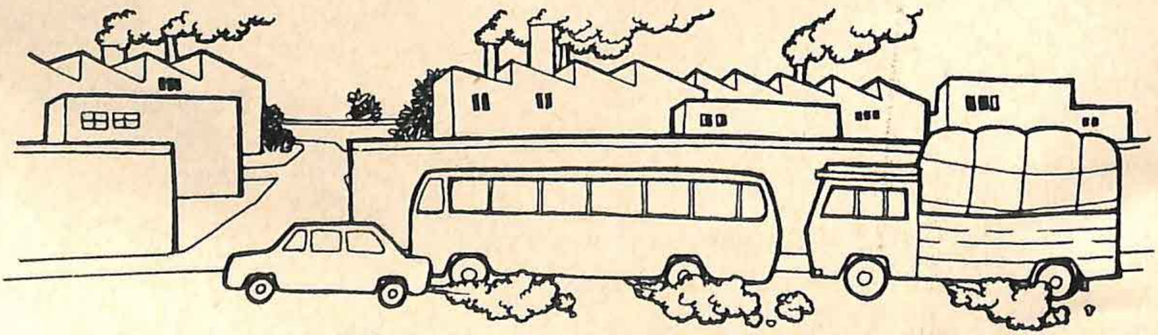
Fresh air

Fresh air is clean. We will be healthy if we breathe in fresh air. In the villages, the air is usually fresh and clean. There are lots of trees in the villages which keep the air pure.

Air is fresh in villages.

Foul air

Air in big cities is full of dust and smoke. The cities are crowded. People use cars, buses and trucks as means of transport. These vehicles give out smoke into



Air in big cities is full of dust and smoke.

the air and make it impure. Chimneys from homes and factories send smoke into the air and make it more impure. People who live in cities are often not healthy as they breathe in this foul air. Apart from dust and smoke, air also contains germs that cause diseases.

Air has dust particles

See a beam of sunlight entering a dark room. Don't you see dust particles floating in the air?

Air has dust particles.

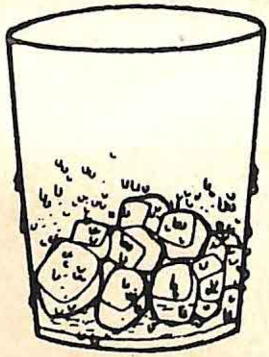
Old books kept in a shelf are covered with dust. Where does the dust come from? Of course it is from the air!

When we sweep our rooms we see dust particles rising from the floor. If dust particles get into our nose we sneeze them out.

Air has water vapour

Take some salt and keep it in the open for some time. What do you see? The salt gets moist. Water vapour in the air makes it moist.

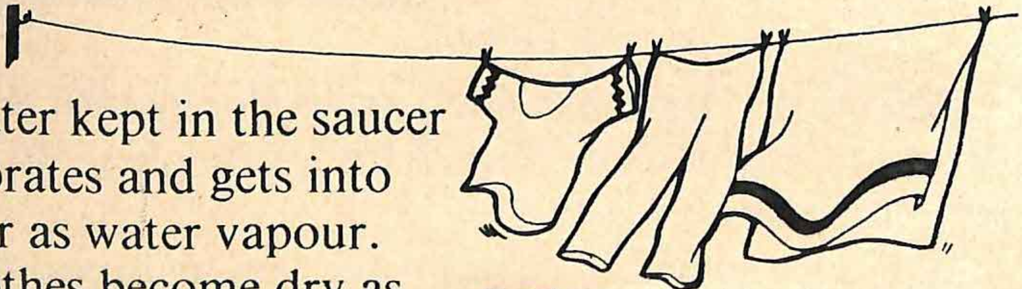
Put some ice cubes in a dry glass tumbler. Leave it for some time. What do you see outside the tumbler? Droplets of water collect on the sides of the tumbler. Water vapour from the air collects on it. Dew drops are nothing but water vapour condensed on blades of grass.



Air has water vapour.

How does air get water vapour?

Keep some water in a saucer. Boil some water in a vessel. Hang wet clothes on a clothesline. What do you see in these cases?



Air takes away moisture from clothes.

Water kept in the saucer evaporates and gets into the air as water vapour.

Clothes become dry as air takes away moisture from them.

Boiling water sends out steam. Steam is hot water vapour. Steam gets into the air.

Boiling water

Water vapour in the air forms clouds

Water evaporates from lakes, rivers and oceans and gets into the air.

Water vapour along with dust and smoke forms clouds.

Things to remember

1. Air contains dust and smoke.
2. We sneeze when dust particles get into our nose.
3. Foul air contains harmful germs.
4. Air has water vapour.
5. Water vapour from the air condenses on cold surfaces. Dew drops are formed in this way.
6. Clouds are formed from water vapour mixed with particles of dust and smoke.

Things to do

Do the experiments given in this lesson at home. Note down what you see in your note book.

Exercise

Write short answers to these questions in your note book.

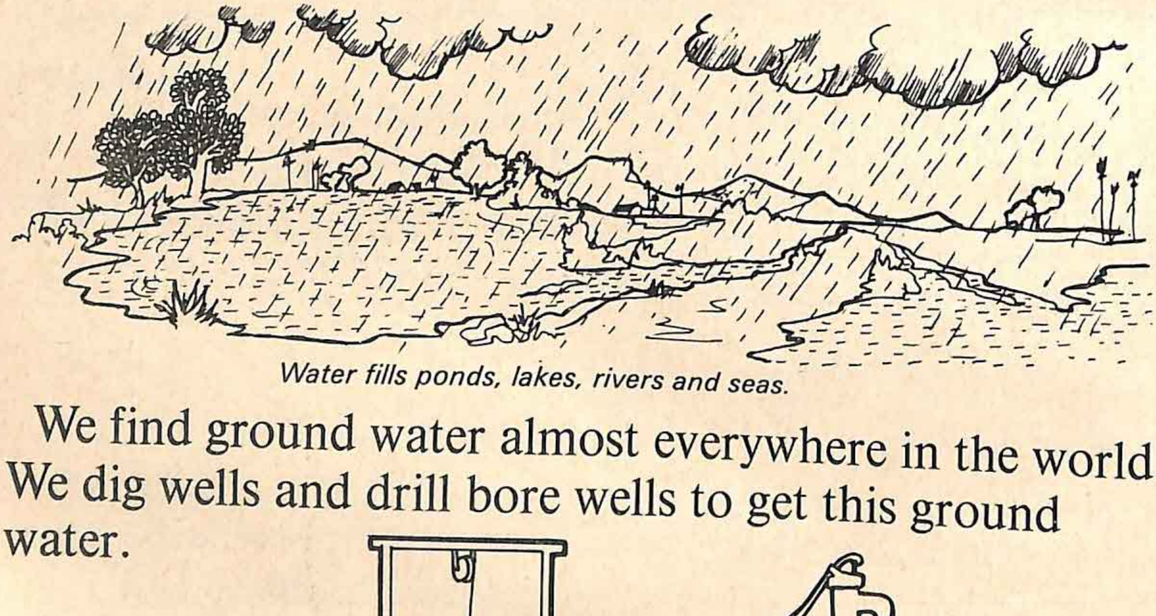
1. Why is air pure in villages?
2. How does air become impure in big cities?
3. How are dew drops formed?
4. How are clouds formed?

7. Water is necessary

All living things need water. They also contain water. There can be no life without water.

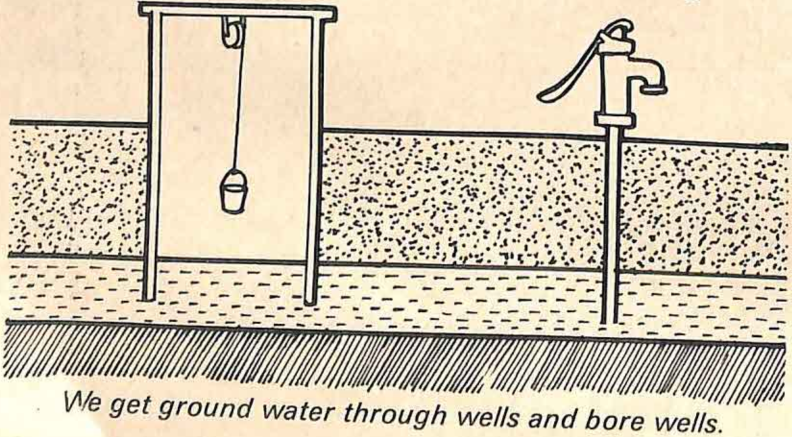
Where do we find water?

Water is one of the common things we find around us. Water fills ponds, lakes, rivers and seas. Rain water seeps through the soil and collects as ground water.



Water fills ponds, lakes, rivers and seas.

We find ground water almost everywhere in the world. We dig wells and drill bore wells to get this ground water.



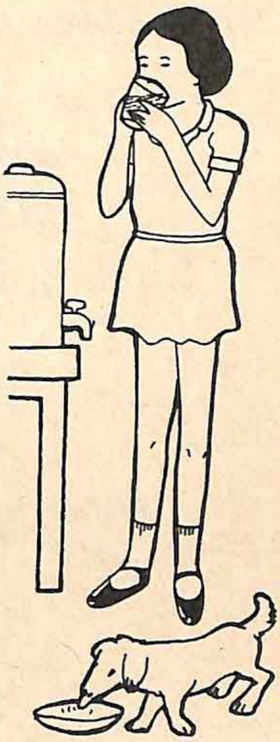
We get ground water through wells and bore wells.

Why do we need water?

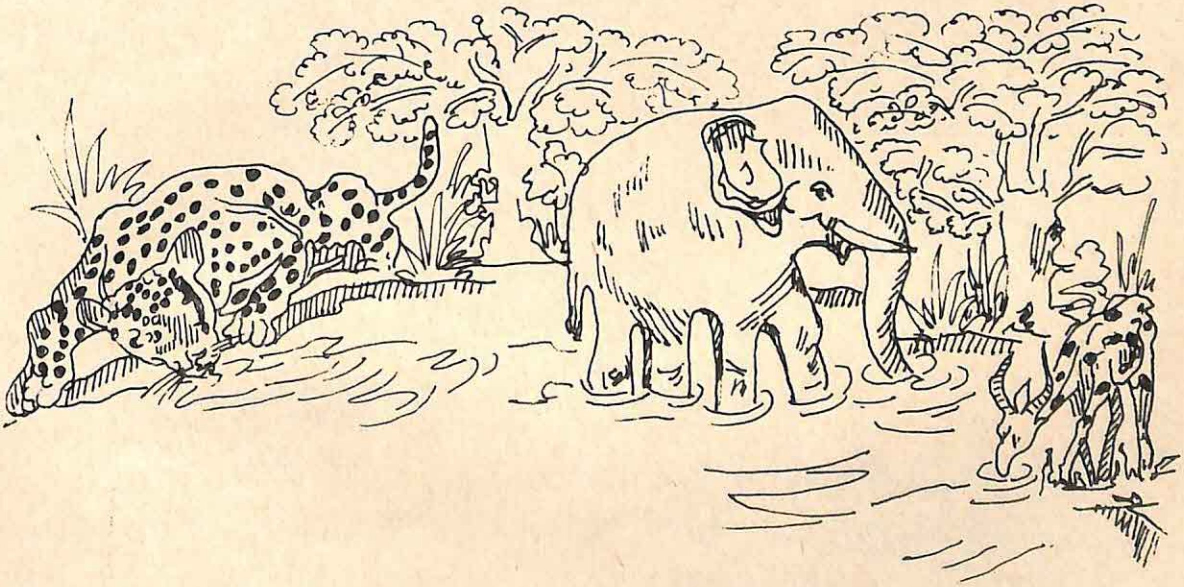
We need water to keep us alive. We drink water to quench our thirst. We give water to our domestic animals. We water our garden plants. Water keeps animals and plants alive.

How do wild animals and plants get water to keep them alive?

Wild animals drink water from water holes, streams and rivers. Wild plants get water from the rain. Their roots suck up ground water.

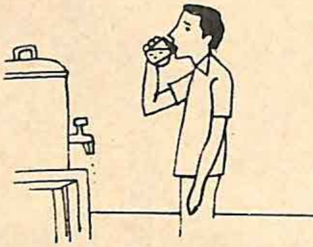


We drink water to quench our thirst.

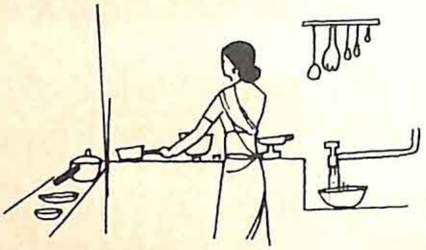


Wild animals drink water from water holes; wild plants suck up ground water through their roots.

Water has many uses

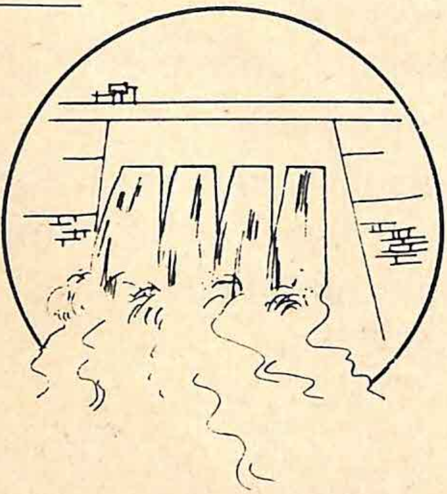


For drinking

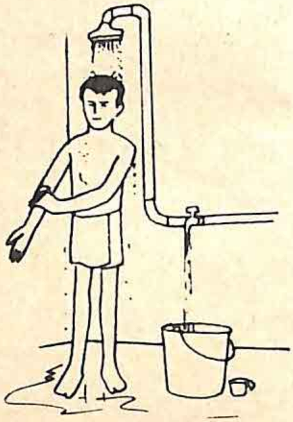


For cooking

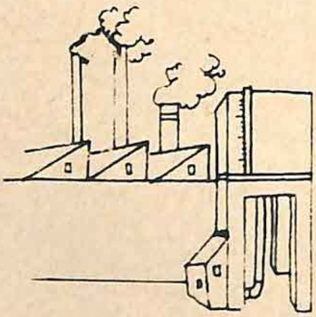
For washing clothes



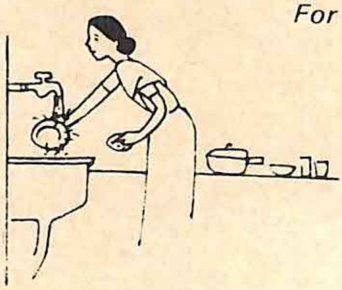
Water reservoir



For bathing

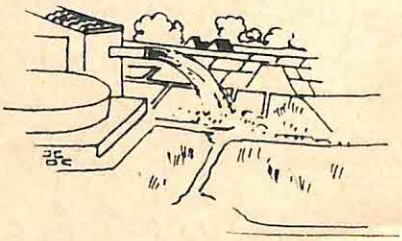


In factories



For washing vessels

For watering gardens

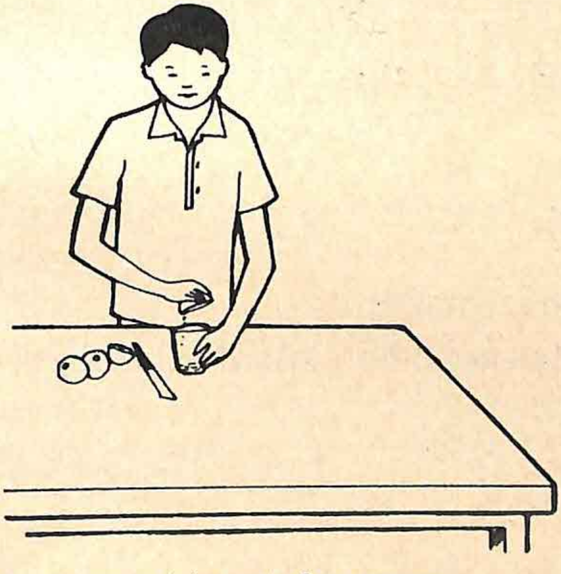


For watering fields

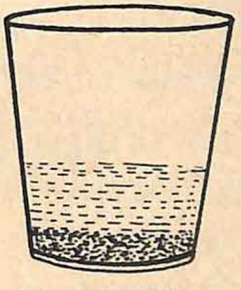
Living things contain water

All living things contain water. You can show this by a simple experiment.

Squeeze the juice out of an orange. Let the juice stand for a while and then look at it. A clear liquid stands on top and a yellow substance settles at the bottom. Pour the clear liquid in a saucer and let it evaporate. You see very little material left in the saucer. Water from the orange juice has evaporated.



Squeeze the juice out of an orange.



Let the juice stand for a while.

Water has impurities

Many impurities like dead leaves, dirt and even dead animals float in water. In the rainy season water becomes muddy. It has many dissolved salts in it. It also contains harmful germs.

How to make water fit for drinking

Boiling water kills disease germs. Filtering water removes mud and other floating impurities. Therefore, water filtered, boiled and cooled is fit for drinking.

Do you know?

1. Animals like deer and rabbits do not need to drink as much water as other animals as they eat juicy and tender shoots.
2. Chlorine gas is added to water to kill germs before it is supplied to people in a big city.

Things to remember

1. Water is very essential for life.
2. Rain water seeps through the soil and collects as ground water.
3. Ground water is found almost everywhere in the world.
4. Water has many uses. We use it for cooking, drinking, bathing, washing, for watering plants and in factories.

Things to do

1. Make a home filter out of a flower pot, in this way: Cover the

hole of a flower pot with layers of stones, charcoal, gravel and sand, all washed clean and dried. Keep the flower pot raised on two bricks with space in between. Place a vessel to collect water under the hole. Now your home filter is ready. If you pour muddy water into the filter, the mud stays back and clear water collects in the vessel kept below.

2. Go to the sea shore or a river bed. Scoop out mud. Soon you will find clear water springing up! This is how people get drinking water, by digging wells, even if the sea is close by! So also, a dry river bed provides drinking water to people in the hot summer!

3. Just as you find plenty of water in orange juice, you can find water in other living things too! For this, do the following:
   a. Squeeze fresh flowers and leaves—even fresh meat. You will find liquid oozing out of them. Most of this liquid is water.
   b. Do brisk exercise. You sweat a lot. Sweat is nothing but impure water sent out of the body.

4. Collect pictures of animals and human beings drinking water. Put them up on the display board in your classroom. Label the animals.

5. Find out from where your city gets its water supply. Visit the place with your teacher. Learn how the water is filtered, made free of germs and pumped to the big storage tanks (reservoirs).

Exercises

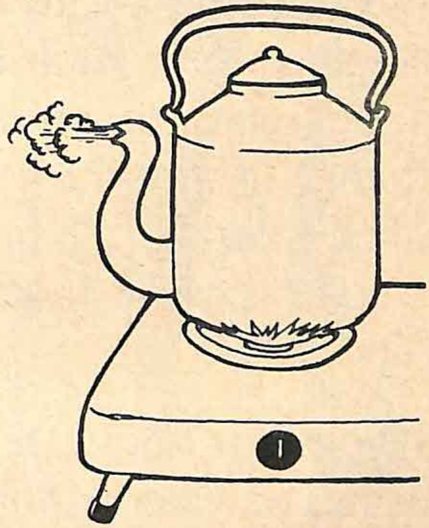
1. Answer the following questions briefly in your note book:
   a. How is ground water collected?
   b. How do wild animals get water?
   c. How is muddy water cleaned?
   d. Which water is fit for drinking?

2. Copy only the correct sentences in your note book.
   a. Tender shoots contain plenty of water.

b. Water has salts floating in it.
c. Chlorine gas kills germs.
d. Rain water fills ponds and lakes.
e. We dig wells to get river water.
f. Rain water seeps through the soil and collects as ground water.
g. Plant roots suck up ground water.
h. Domestic animals drink water from water holes.

3. Draw a picture of a home filter and name the parts.

8. Forms of water and the water cycle

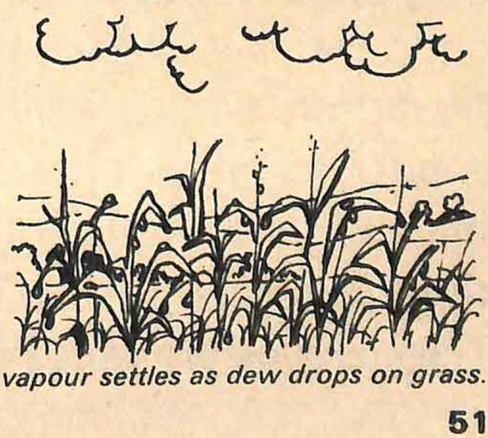


Steam contains water vapour.

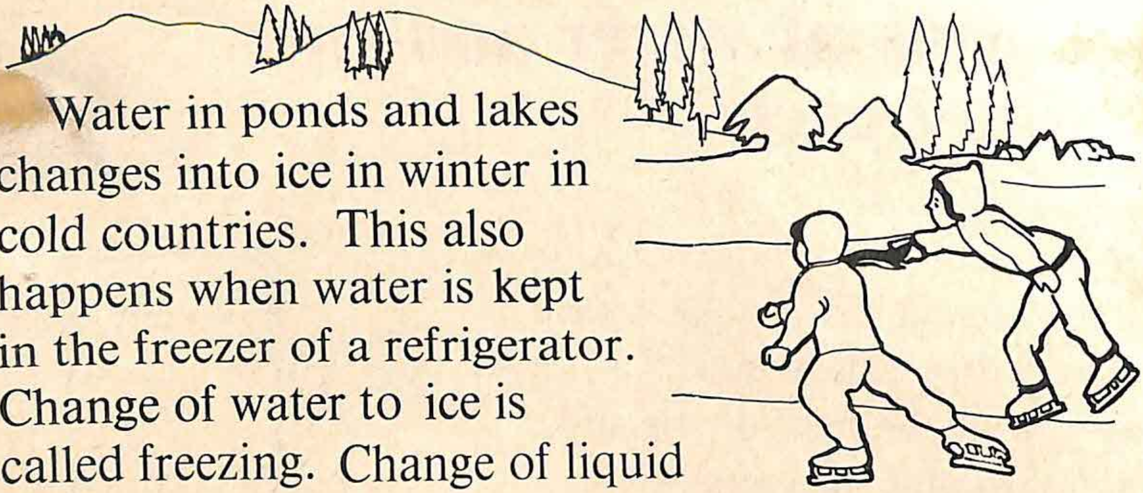
Air is a gas. The water vapour we find in the air is also a gas.

You know that water is a liquid. Because of the heat of the sun, water changes into gas or vapour and rises up from the surface of ponds, pools, lakes, rivers and seas. Water rises up as steam when you boil it. Steam contains lots of water vapour. The vapour in steam is packed very closely. This change of water to water vapour is called evaporation. Change of liquid to gas is called evaporation.

You have already learnt that water vapour settles down as dew drops on blades of grass. This happens when water vapour cools down. Change of water vapour to water is called condensation. Change of gas to liquid is called condensation.



Water vapour settles as dew drops on grass.



Water in ponds and lakes changes into ice in winter in cold countries. This also happens when water is kept in the freezer of a refrigerator. Change of water to ice is called freezing. Change of liquid to solid is called freezing.

Water in ponds freezes in winter in cold countries.

You thus find water in three forms: as water vapour (gas), as water (liquid), and as ice and snow (solid).

Water changes to ice in the freezer.

Water cycle

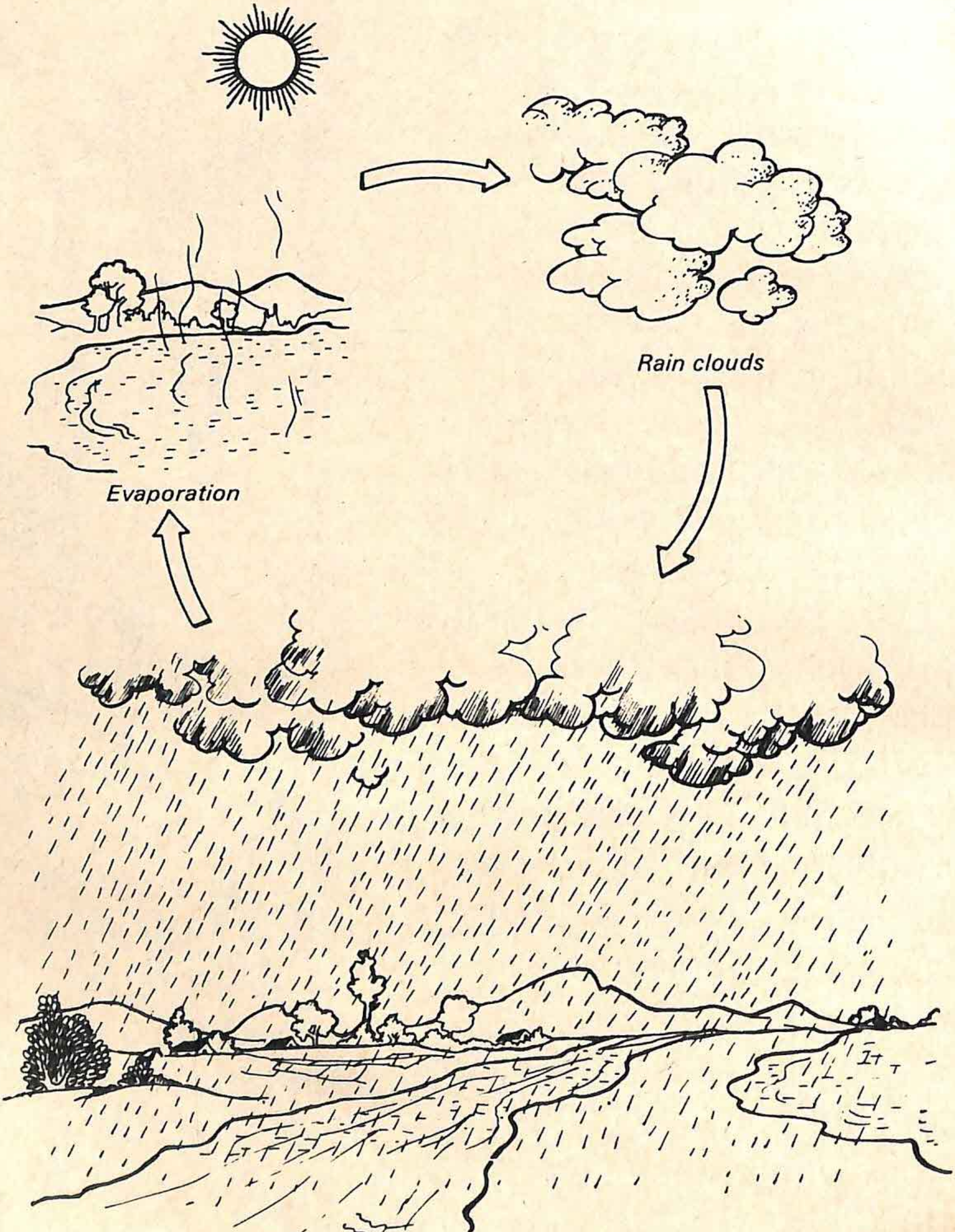
Now you know that the heat of the sun makes water evaporate from ponds, lakes and seas. Water vapour forms into clouds when it condenses on dust particles found in the air. Cool air makes tiny drops of water in the cloud join together to form bigger drops. They make the cloud get darker. Dark clouds are called rain clouds. Now the big drops of water cannot stay high up in the sky. So they fall to the ground as rain. Rain water seeps through the soil and collects as ground water. The rain water that pours over the mountainside forms waterfalls and streams. Mountain streams join to form a river. These rivers join the sea. Rain water also collects in ponds, pools, and lakes.

Once again water evaporates from each of them because of the heat of the sun. Rain clouds are thus formed and we get rain. This long journey of water vapour from the sea and back to the sea through clouds and rivers is called the water cycle.

The water cycle repeats itself year after year. It is one of Nature's important happenings. Without this, there can be no life on earth!

Rain water forms waterfalls and mountain streams.

The water cycle



Things to remember

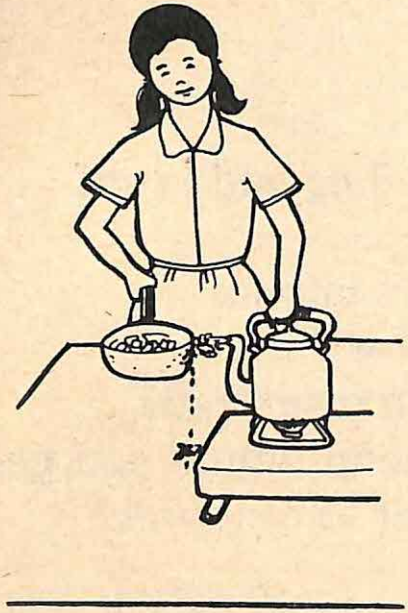
1. Water vapour is a gas.
2. Water is a liquid.
3. Water vapour condenses on cooling and forms water.
4. On further cooling water freezes into ice.
5. Ice and snow are solid forms of water.
6. Ice and snow melt on heating to form water.
7. Thus water has three forms: solid, liquid and gas.
8. The heat of the sun causes water to evaporate from ponds, lakes and seas.
9. The long journey of water vapour from the sea and back to the sea through clouds and rivers is called the water cycle.
10. The water cycle repeats itself year after year.

Things to do

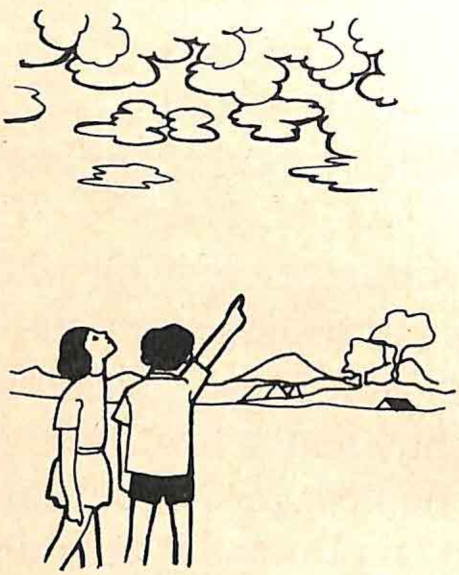
1. You can make a cloud and create rainfall at home.

   Boil water in a kettle. Hold a vessel containing ice-cold water close to the spout. When steam issues out of the spout it hits the cold surface of the vessel. Steam is the cloud you have made. This cloud has plenty of water vapour in it. Water vapour condenses to form droplets of water that drip from the vessel. The falling droplets of water is the rain you have created.

2. Watch the clouds on a rainy day. See how they move very fast in the direction of the wind. Note how you feel just before it begins to rain. Will you not feel the pleasant cool wind blowing against you? Also find out which cloud gives you rain. Surely it is the black cloud and not the white one.



Making rain



Watching clouds

Exercises

1. Match the following:

a. water vapour	joins the sea
b. ice	mountain streams
c. ground water	gas
d. waterfalls	well
e. river water	solid form of water

2. Fill in the blanks:
. . . . ≋ is a liquid. The heat of the . . . . ☀ evaporates the water to form water vapour. This water vapour in the air forms . . . . . . ☁ When air becomes cool, water from the clouds pours down as . . . . 🌧.

3. Name the three states of water.

9. The seasons

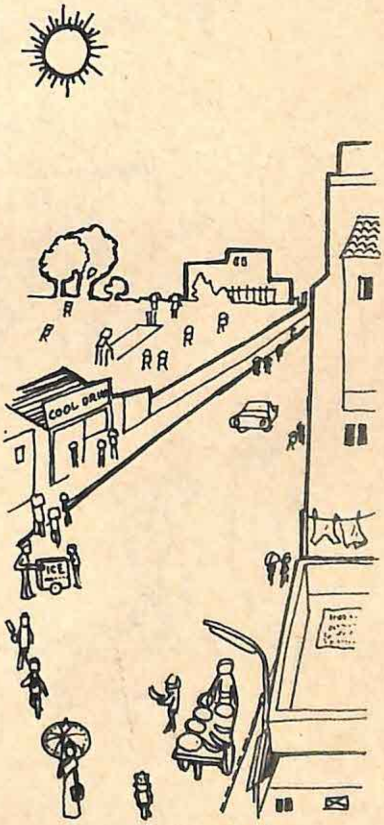
We have three different seasons in our country. The hot season, the rainy season and the cold season.

Which one are you having right now? Is the weather hot or cold? Is it calm or windy? Is it cloudy or is it raining? We have different kinds of weather in different seasons.

The summer

The hot season is called summer. The sky is clear in this season. It is very hot during the day time. We sweat a great deal while at work. So we wear light, cotton clothes. We also feel very thirsty. We get tired very soon. Even plants look tired with their drooping leaves! We close down our schools and have summer holidays!

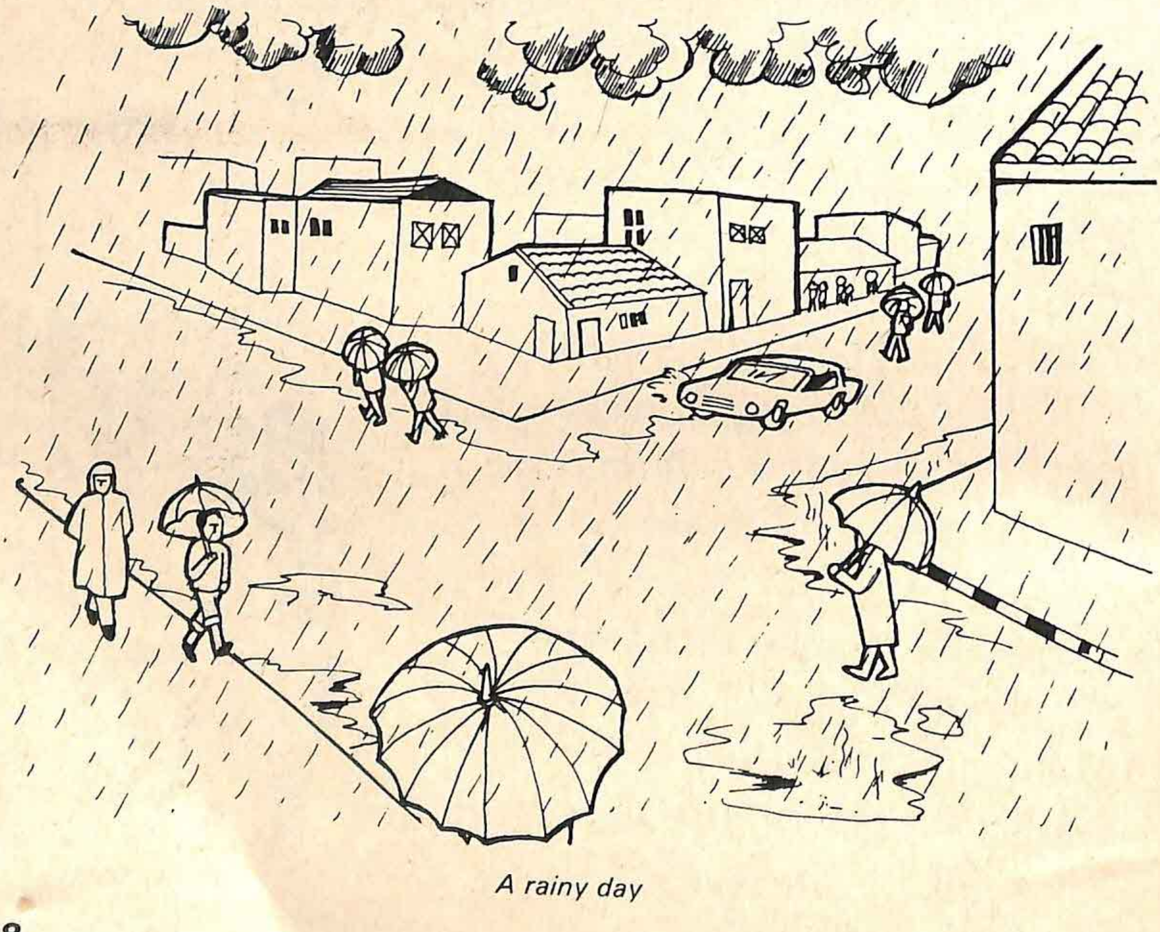
Towards the end of summer lots of water vapour from the rivers and seas gather to form clouds. We get rain in the evenings. This cools down the earth.



A sunny day

The rainy season or the monsoon season

The heat of the sun causes monsoon winds. We get this as the summer comes to an end. The monsoon winds carry lots of water vapour from the seas to form clouds of different shapes and colour. When the rain-clouds hide the sun, the day becomes dark. We get heavy showers during day and night. We hear thunder and see lightning. Thunder storms cause a great deal of damage to life and property.



A rainy day

The winter season

When clouds change their colour from dark grey to white, we know that the monsoon season has come to an end. The sunshine is less warm. Air becomes chill. Weather in the day time becomes pleasant but the night becomes very chill. We wear warm clothes. We celebrate New Year's Day in the middle of the cold season. Once again we get the seasons in the same order. These three seasons get repeated year after year.

A winter night

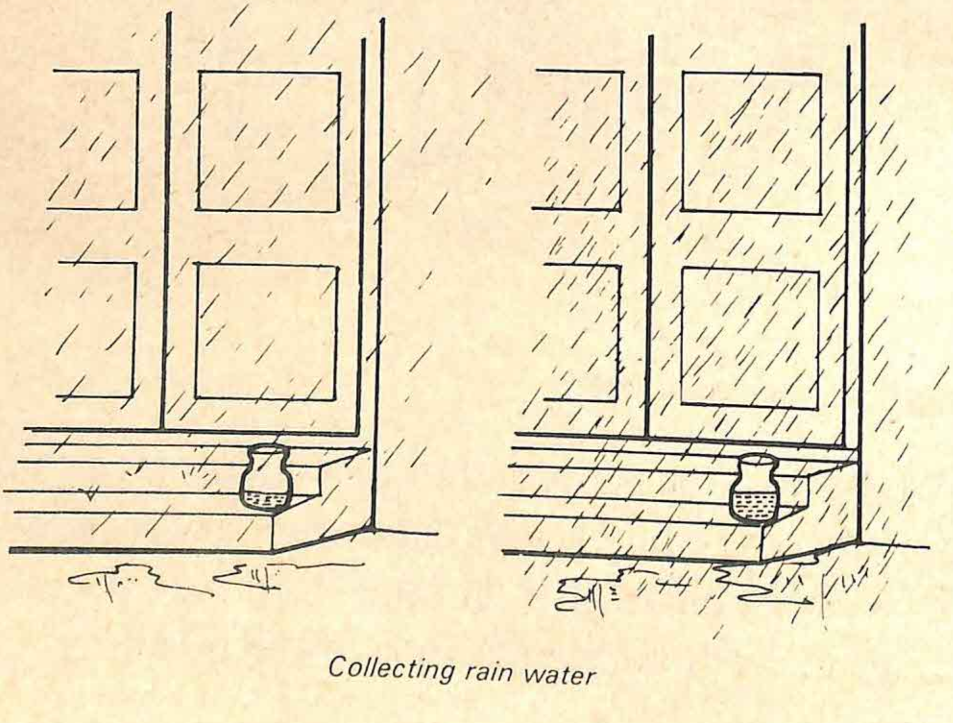
Things to remember

1. We have three seasons in our country: the summer season, the rainy season and the cold season.
2. The sky is clear on a summer day.
3. Late in summer we get rain in the evening.

4. Summer rain cools down the earth.
5. Monsoon winds bring rain clouds.
6. We hear thunder and see lightning in this season.
7. Thunder storms cause damage to life and property.
8. The heat of the sun is less in the cold season.
9. Nights become very chill in this season.
10. These three seasons get repeated year after year.

Things to do

1. IN YOUR NOTE BOOK
   Sketch the scenes you see in each of the three seasons and colour your drawings.
2. Collect rain water in a bottle every day during the rainy season. Find out on which days you collect the most and the least amounts and write the date in your notebook for each of them.



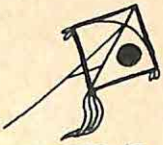
Collecting rain water

3. FOR YOUR CLASS DISPLAY BOARD

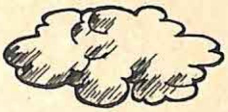
Make a weather calendar as shown below for four weeks in the rainy season. Draw suitable figures as in the key to show the type of weather you have for a particular day.

Weeks	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
First Week							
Second Week							
Third Week							
Fourth Week							

Key: windy:

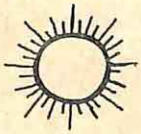


dull :



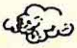
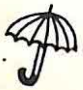
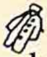
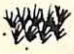
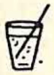
rainy :

sunny :



4. See what happens to a dry meadow after the first summer showers. Sketch how the meadow looks before and after the showers. Show it to your teacher.

Exercises

1. Fill in the blanks:
   a. We have dull weather on a ....  day.
   b. We never go out of our houses without an ....  or a ....  on a rainy day.
   c. We see a meadow full of ....  soon after a summer shower.
   d. We drink ....  in summer to quench our thirst.
2. Write four sentences about the weather on a day you had gone for an excursion.
3. Write three or four lines explaining the difference between season (climate) and weather.

10. Travellers around the sun

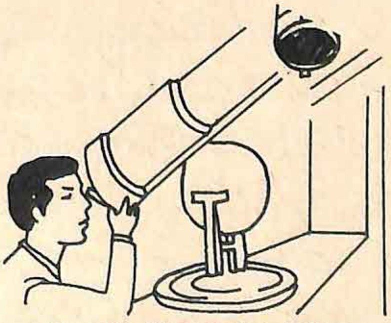
Every day you see the sun rising in one part of the sky and setting in the opposite direction. From the part where it rises, it travels across the sky to reach the other end of it. It is not the sun which moves. Actually it is the earth which spins like a top. That is why the sun appears to move across the sky.

The earth travels around the sun.

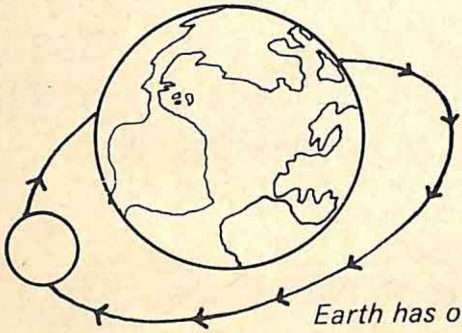
As it spins the earth travels around the sun along with its moon. The path along which it moves around the sun is called its 'orbit'.

More travellers around the sun

If you watch the sky carefully on a clear night, you can see many stars making beautiful patterns! These stars 'twinkle'. Among the twinkling stars, you can see some bright objects which



Looking at the sky through a telescope only 'blink'. These are not stars, but 'travellers' around the sun just like our earth. These travellers, including the earth, are called the 'planets'. The word planet means a 'wanderer'. Just as earth has an orbit of its own, other planets also have orbits of their own to travel around the sun. Earth has one satellite, the moon, which revolves around it. Some other planets also have their own moons.



Earth has one satellite.

Stars are suns. They have light of their own and they twinkle. The planets do not have light of their own. They only borrow light from the sun and they only blink.

The solar system

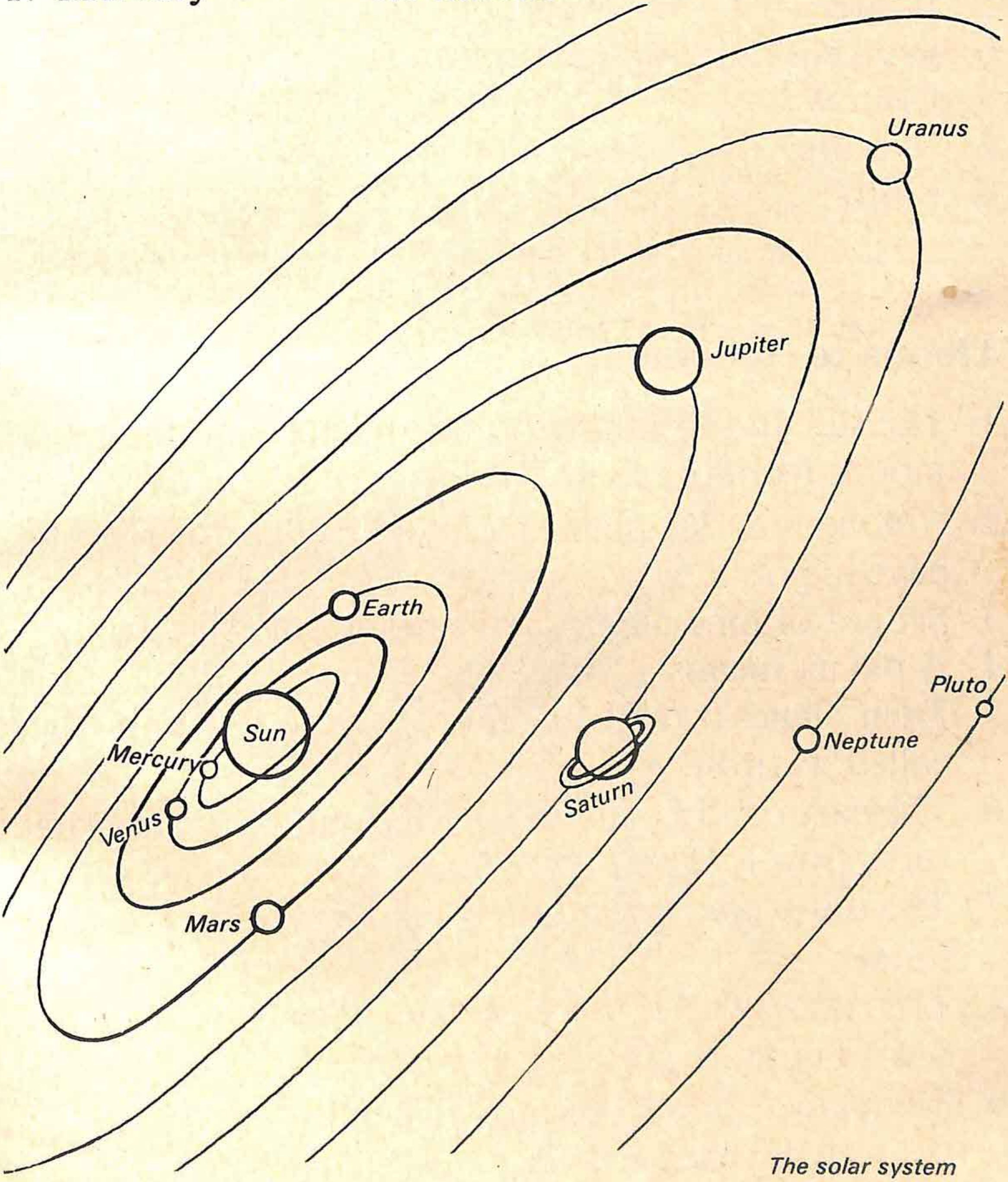
Nine planets are known to travel around the sun. Out of them, six have moons of their own. The sun's family, with its nine planets and their moons travelling in definite orbits, forms the 'solar system'.

Among the members of the solar system, only planet earth seems to have life on it.

The list of planets and their moons

(in the order of their nearness to the sun)

1. Mercury no moons



The solar system

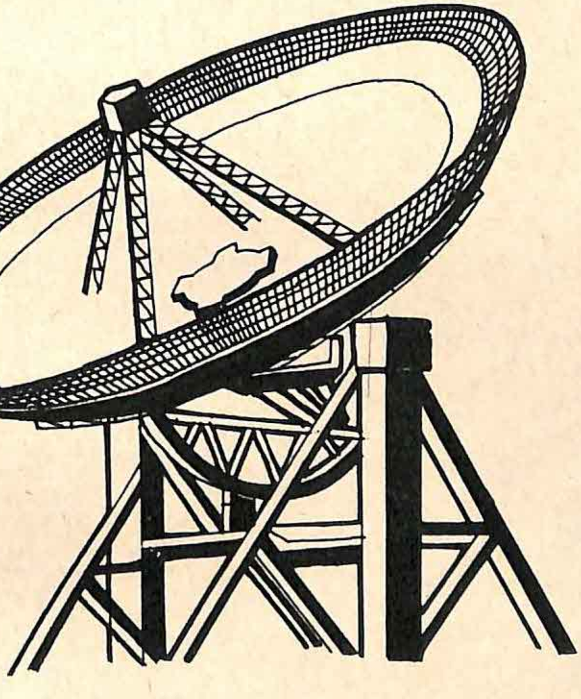
2. Venus	no moons
3. Earth	one moon
4. Mars	two moons
5. Jupiter	twelve moons
6. Saturn	ten moons
7. Uranus	five moons
8. Neptune	two moons
9. Pluto	no moons

Things to remember

1. The sun and its family of nine planets and their moons form the solar system.
2. Among the nine planets, only planet earth seems to have life on it.
3. Six out of nine planets have moons of their own.
4. A planet means a 'wanderer'.
5. Each planet travels around the sun in a definite path called its orbit.
6. The earth and its moon travel around the sun. The earth travels in its orbit.
7. The other planets and their moons also do the same thing.
8. The stars 'twinkle' because they have light of their own. The stars are suns.
9. The planets 'blink' because they have no light of their own. They only borrow it from the sun.

Things to do

1. IN YOUR NOTE BOOK
   Write the names of the planets and the number of moons they have in the order of their distances from the sun.
2. FOR YOUR CLASS DISPLAY BOARD
   Take a big drawing sheet. Copy the diagram of the solar system from the book. Write the names of the planets. Write the number of moons they have within brackets.
3. Look at the sky every night; if possible every month. See how the star patterns shift their positions. Look at them and learn to recognise them. Spot out planets that 'blink' in the midst of twinkling stars.
4. Find out what planets the days of the week are named after.



4. Look at this picture of a radio telescope. Find out how it is used and why it is better than an ordinary telescope.

Exercises

1. Find the odd one out in each group:
    a. sun, star, planet.
    b. Venus, Moon, Saturn.
2. Match the following:

a. planet	twelve moons
b. stars	path of the planet around the sun
c. Jupiter	twinkle
d. Uranus	wanderer
e. orbit	five moons
f. Mercury	has life on it
g. Earth	far away from the sun
h. Pluto	very close to the sun

11. Sunlight and shadow

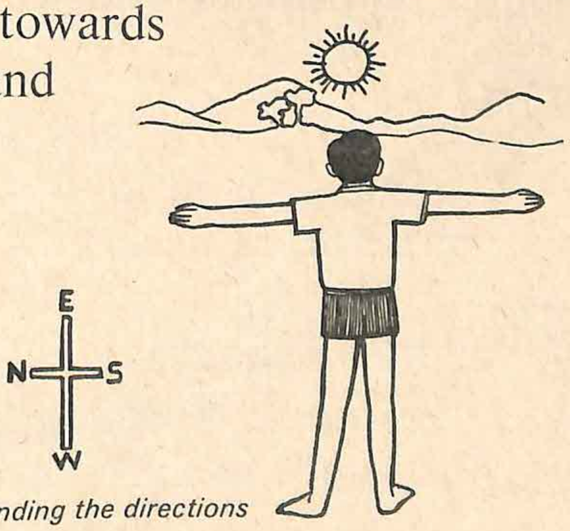
Wake up in the morning when the sky just turns bright. Come out and see which side of the sky gets brighter and brighter. Why?

It is the sun that brightens up the sky! Every morning it appears from the same side. It travels across the sky during the day time. It rises from one side, travels up the sky in the morning, comes right over your head at noon and goes to the opposite side in the evening and then disappears!

How to find the direction

The direction in which the sun rises is called the east. The direction in which it sets is called the west.

If you stand facing the east and stretch out your arms, your left hand points towards the north and your right hand points towards the south. Your back is, of course, towards the west. Fishermen out at sea and farmers in the fields find their direction in this way.



Finding the directions

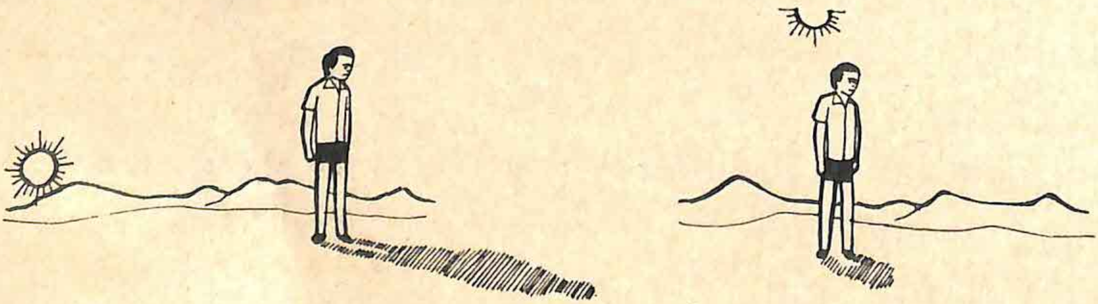
Why is sunlight hot and bright? Why is it necessary?

As you already know, the sun is a fiery ball. It is made up of hot glowing gases which produce a lot of heat and light. The sun is so bright that we cannot look straight at it. It is because we are millions of kilometers away from the sun that we are not burnt up! It is many many times bigger than the earth. But it looks so small because it is very far from the earth.

Plants grow and store food using sunlight. There can be no life on earth without sunlight.

Sunlight and shadow

Whenever you walk in sunlight your shadow goes along with you. If you stand facing the sun, your shadow falls behind you.



Long and short shadows

Your shadow is very long in the morning. As the day proceeds, the shadow gets darker, but shorter. It is shortest at noon when you can find it almost hugging your heels! Beyond noon the shadow once again grows longer. It is very long in the evening. As you change the direction of your movement, your shadow also changes direction.

Shadows are also formed by moonlight, candle light and electric light.

How is a shadow formed?

Your shadow is formed when you stand in the way of sunlight or any other light.

A shadow is formed when something through which light cannot pass comes in the way of light.

Things to remember

1. The sun gives us heat and light.
2. There can be no life on earth without sunlight.
3. We find directions by looking at the position of the sun in the sky.
4. The sun rises in the east and sets in the west.
5. A shadow can change its length and direction.
6. A shadow is formed when something comes in the way of light.

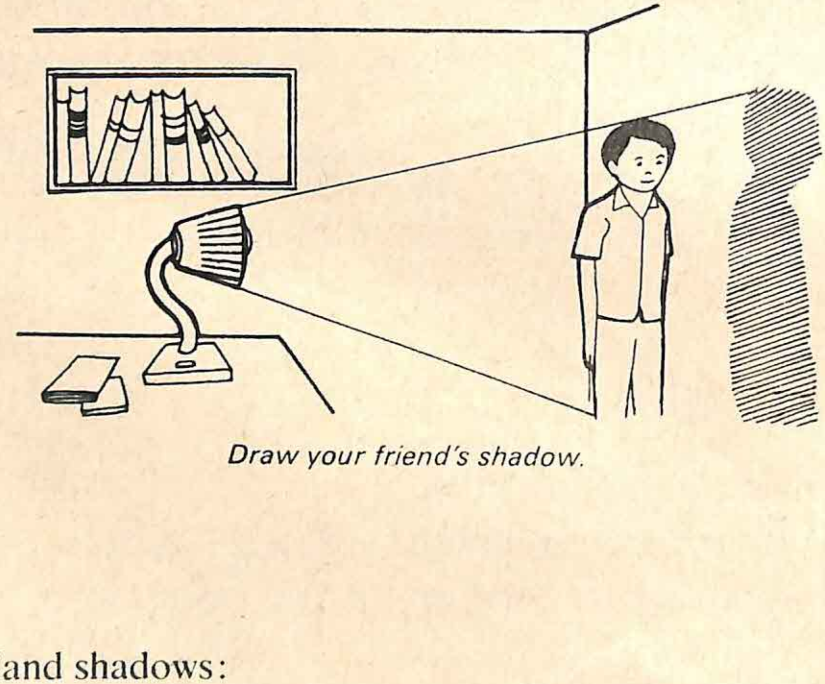
Things to do

1. Stand in sunlight and ask your friend to mark the position of your shadow. Let your friend mark the top of the shadow with a stone.

   Do this at least thrice a day: once in the morning, once at noon and once in the evening. See how the length of your shadow changes every time.

2. FOR YOUR CLASS DISPLAY BOARD

   You can draw your friend's shadow in the following way. Place a table lamp on a table. Ask your friend to stand in front of the lamp, close to the wall. Paste a drawing sheet on the wall in the place where the shadow falls. Carefully draw the outline. Shade the inside. A shadow-picture is ready for your display board.



Draw your friend's shadow.

3. Hand shadows:

   You can make some interesting patterns or shadow-pictures on the wall by bending your fingers and folding your hands in different ways, in front of a bright light. If you practice well, you can get the pictures of animals and birds on the wall to delight your friends.

Exercises

1. Match the following:

a. rising sun	shortest shadow is formed
b. shadow changes	west
c. setting sun	east
d. at noon	needs light
e. formation of shadows	length and direction

2. Write yes or no in the brackets:

a. Shadows are formed in the moonlight also. (   )
b. The sun gives us heat and light. (   )
c. A shadow is formed when nothing comes in the way of light. (   )
d. Farmers in the fields and fishermen at sea find their direction by seeing the position of the sun in the sky. (   )

12. Formation of rocks and soil

You know that the earth is a member of the solar system. We find different types of rocks and soils on earth. How are rocks and soil formed?

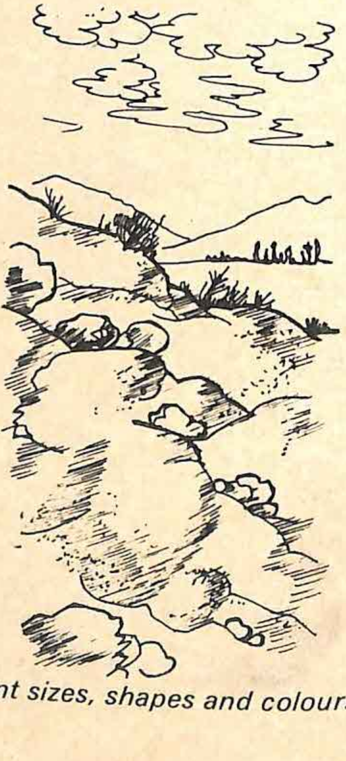
Formation of the earth

Scientists believe that a big chunk of the fiery sun got separated and thrown out millions of years ago. This became the earth. This is where we now live!

Cooling of earth to form rocks

The earth at first was very hot, so hot that the materials of which it is made were in the state of a hot liquid! Gradually the surface of the earth got cooler and the liquid materials formed rocks.

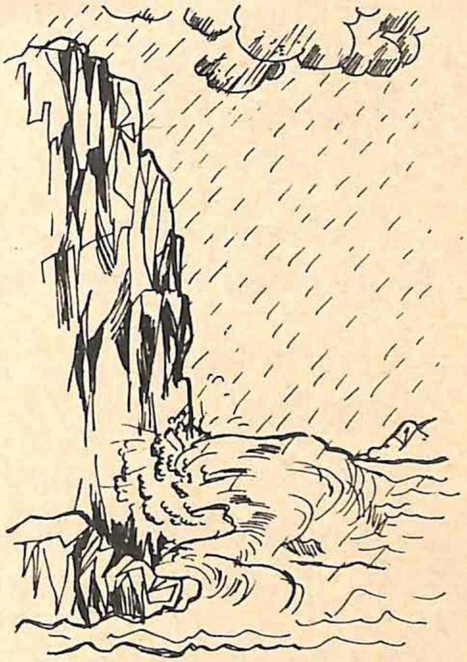
Rocks thus formed are of different colours, shapes and sizes.



Rocks are of different sizes, shapes and colours.

Breaking of rocks

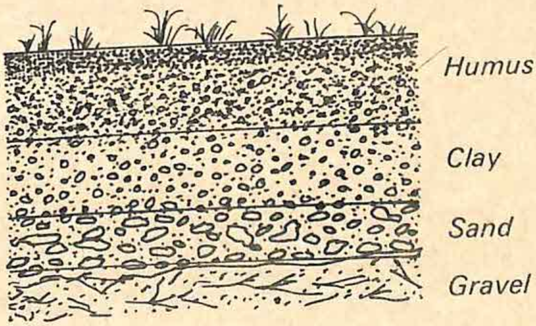
Sun, wind and rain hit against the rocks constantly and break them into pieces. Tiny pieces of rock get pounded and turn into particles of sand, silt and clay. These particles are not of the same size. Sand particles are large enough to be seen clearly, silt particles are smaller and clay particles are too small to be seen clearly.



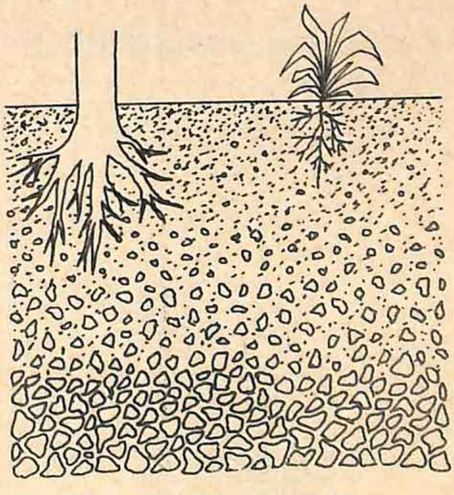
Rocks pounded by rain, wind and waves

Formation of soil

Sand, silt and clay along with humus form soil. Dead and decaying leaves, tiny dead plants and animals



Contents of soil



Soil supports plant life

form humus. Soil also contains pebbles and gravel.

Soil contains lots of minerals. Minerals form the food for the plants. Thus soil supports plant life.

Things to remember

1. The molten earth's surface cooled down to form rocks.
2. Rocks are broken into pieces by the wind, the rain and the sun to become soil particles.
3. Soil supports plant life as it contains minerals.

Things to do

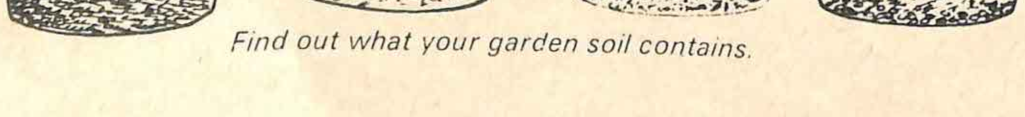
1. To find out what your garden soil contains, do the following simple experiment:

   Take some garden soil in a wide-mouthed bottle. Pour water into it and stir the soil well with a stick.

   Allow it to settle down.

   You see humus floating on top of the water. Humus is lighter than water.

   The topmost layer of soil contains tiny clay particles. A layer of sand is found below it. The bottom-most layer consists of bigger pieces of rock called gravel.



Find out what your garden soil contains.

2. To show that soil contains minerals, collect the soil water in a dish. Heat it. After water evaporates from it, you can find some white material left at the bottom. This consists of minerals which are absorbed by plant roots.
3. FOR YOUR CLASS DISPLAY BOARD
   Collect pictures of rocks of various colours, shapes and sizes. Paste them on a drawing sheet and put it up on the display board.
4. FOR YOUR ROCK TABLE
   Collect samples of rocks for your rock table and try to label them with the help of your teacher.

Exercises

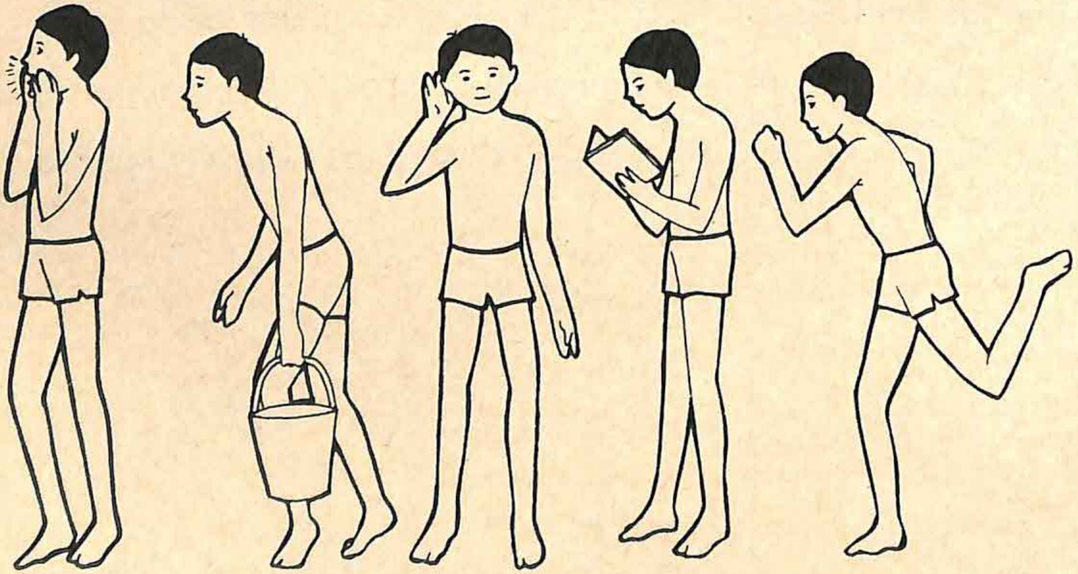
1. Fill in the blanks:
   A big .... 🪨 of the fiery .... ☼ got separated and thrown out. This became the .... 🌍 .It was very hot in the beginning and all the materials in it were in the form of a .... ≋. Gradually the surface of the earth cooled down and turned into .... 🪨. They were broken into pieces by the .... ☼ , the .... 🌬 and the .... 🌧.They turned into particles of .... 🌱 on which plants grew.
2. Draw a picture of garden soil and label its different parts.
3. When was the earth formed? Describe how this happened.

13. The human body: a wonder machine

Have you seen how machines work? You have so many machines to work for you in your house and in your school. They have many parts. Unless all these parts work together properly, the machines cannot function.

The human body is a machine

The human body works just like a machine. It is a wonderful machine that can grow, unlike ordinary



Our bodies move and turn and do a lot of work because our bones and muscles work together.

machines. It has many parts both outside and inside it. We see and feel how the parts found outside work. But we can only feel and understand how some of the parts found inside our body work. These parts are our body organs. They do a lot of work for the human machine. Food is the fuel for this wonderful machine. Food gives heat and energy to do work.

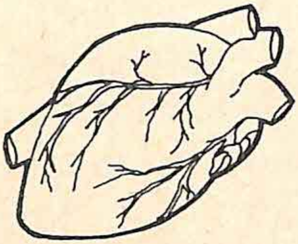
What are the parts of our body?

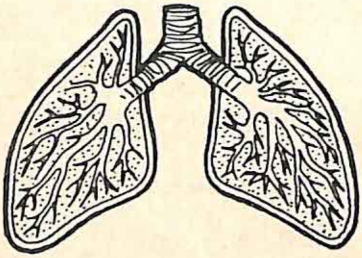
Our body is made up of bones and muscles. The skin covers up all the parts of the body. Bones give support and strength to the body. Without them the body cannot stand up. The muscles are found attached to the bones. They give proper shape to our body organs.

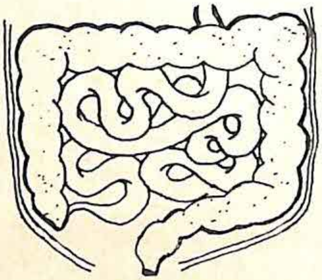
Muscles move the bones

We move our arms and legs, turn our head and do a lot of work only because our bones and muscles work together.

The parts found outside are made mostly of muscles and bones. These are the arms, legs, head, neck, shoulders and hip. The organs found inside our body such as the heart, the lungs and the intestines are made of special types of muscles. They continue to work from the time of our birth, right through our life, whether we are awake or asleep!


Heart


Lungs


Intestines

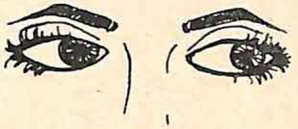
Do you know?

1. We have 208 bones in our body.
2. We have more than 500 muscles in our body.
3. The muscles are attached to bones by tough rope-like structures.
4. Without the frame of our bones, our body will just be a lump of flesh!
5. The lungs are like air-filled balloons.
6. They take in fresh air in exchange for foul air produced by our body.
7. Our heart is a muscular pump.
8. It pumps blood to all the parts of our body.
9. Our stomach is like a mixie, churning all the food we eat into a pulp.
10. The stomach and intestines digest our food.
11. The small intestine absorbs the digested food.
12. The large intestine throws away the undigested food as waste matter.

Things to do

1. Stand in front of a mirror and do the following actions. You can feel your muscles and bones.

   a. Roll your eyes balls. (You do this with the help of tiny muscles that help turn the eye balls.)



   b. Give a broad smile. (Hundreds of muscles take part in this pleasant activity!)

   c. Chew a piece of bread. (Your jaw bones and muscles, teeth and tongue are at work!)

   d. Clap your hands. (Your hand muscles and bones are doing this job, producing a clapping sound.)

e. Lift one of your legs high up to the level of your hip. (The bones and muscles of the hip and the leg help you to do this work. The other leg is able to bear your body weight all by itself!)

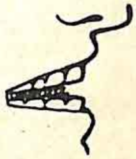
2. FOR YOUR CLASS DISPLAY BOARD
   Collect pictures of various organs of the body. See where they are found in the body. Label them properly and paste them on a drawing sheet and pin it up on your display board.

Exercises

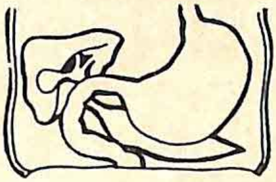
1. Write only the correct sentences in your science note book:
   a. The human body works like a machine.
   b. The lungs pump blood.
   c. Muscles move the bones.
   d. Food is the fuel for the human machine.
   e. Food gives heat and light to do work.
   f. Skin covers all the parts of the body.

2. Find the odd one out in each group:
   a. hand muscle, thigh muscle, stomach muscle
   b. eye, ear, lung
   c. nose, fingers, toes
   d. hair, teeth, nails
   e. stomach. heart, intestines

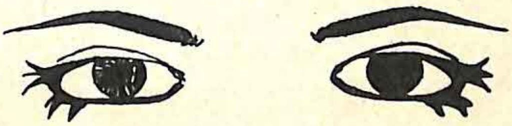
3. Match the following organs with the work they do:



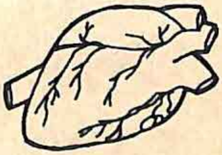
pumps blood



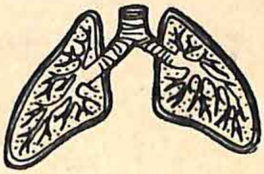
hear sound



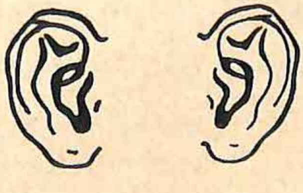
churns food into a pulp



see things



grind food



exchange fresh air for foul air

4. Which organ of the body acts as a pump?

5. Name the fuel used by the human machine.

6. Fill in the blanks:

The human body is a .... Unlike other machines, it can .... The .... are the parts found inside and .... our body. They do a lot of .... for the human .... The fuel for this .... is .... It gives .... and .... to do work.

14. Your health and you

Now you know all about the human body and how it works like a machine. You know very well that machines have to be taken care of if they are to work properly. Likewise, your body needs proper care for it to be healthy and strong.

Food for health

Food is like a fuel. You need food to keep you moving. You need food to keep you warm. You need food to make you grow. You eat food for your health.

Kinds of food your body needs

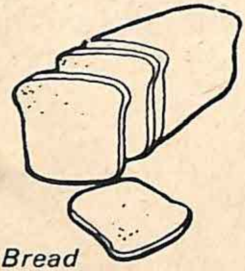
You need to eat many kinds of food. You get food from plants and animals.

You need food that gives your body energy to do work. Bread, rice, wheat, potatoes, sugar and ripe fruits are energy-giving foods.

You need food which builds up your body and helps you to grow. Butter, cheese, eggs, milk, lean meat, peas, beans and pulses are body building foods that help you to grow strong.

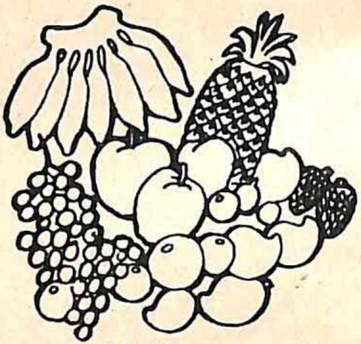
You need food that protects your body against disease germs. It helps you to get strong bones and teeth, healthy skin and good eyesight. Milk, butter, green leafy vegetables, fresh fruits and liver oils are such protective food stuffs.

Energy-giving foods



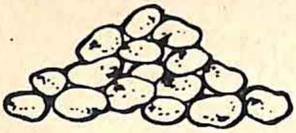
Bread

Rice



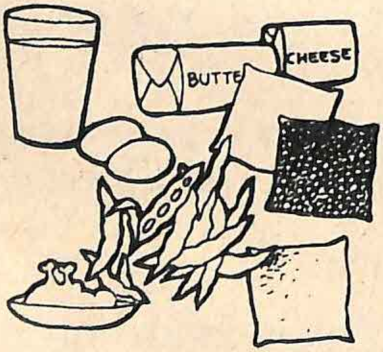
Fruit

Wheat

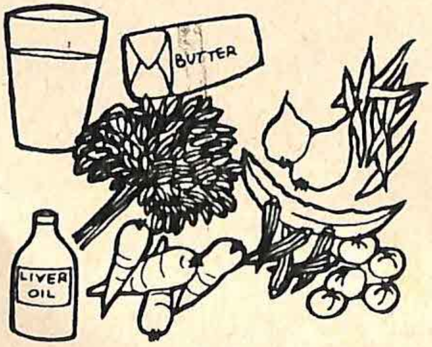


Potatoes

Sugar



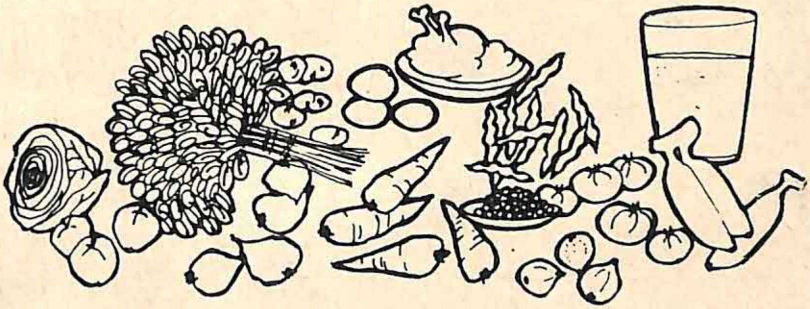
Food which builds up your body



Food which protects your body

Eat enough but not too much

A wise person carefully chooses the food he eats. He does not eat too much. He eats all the different kinds of food stuffs in proper proportions. In all, he eats a well-balanced meal every day! Are you such a wise person? Are you interested in keeping your body healthy and strong?

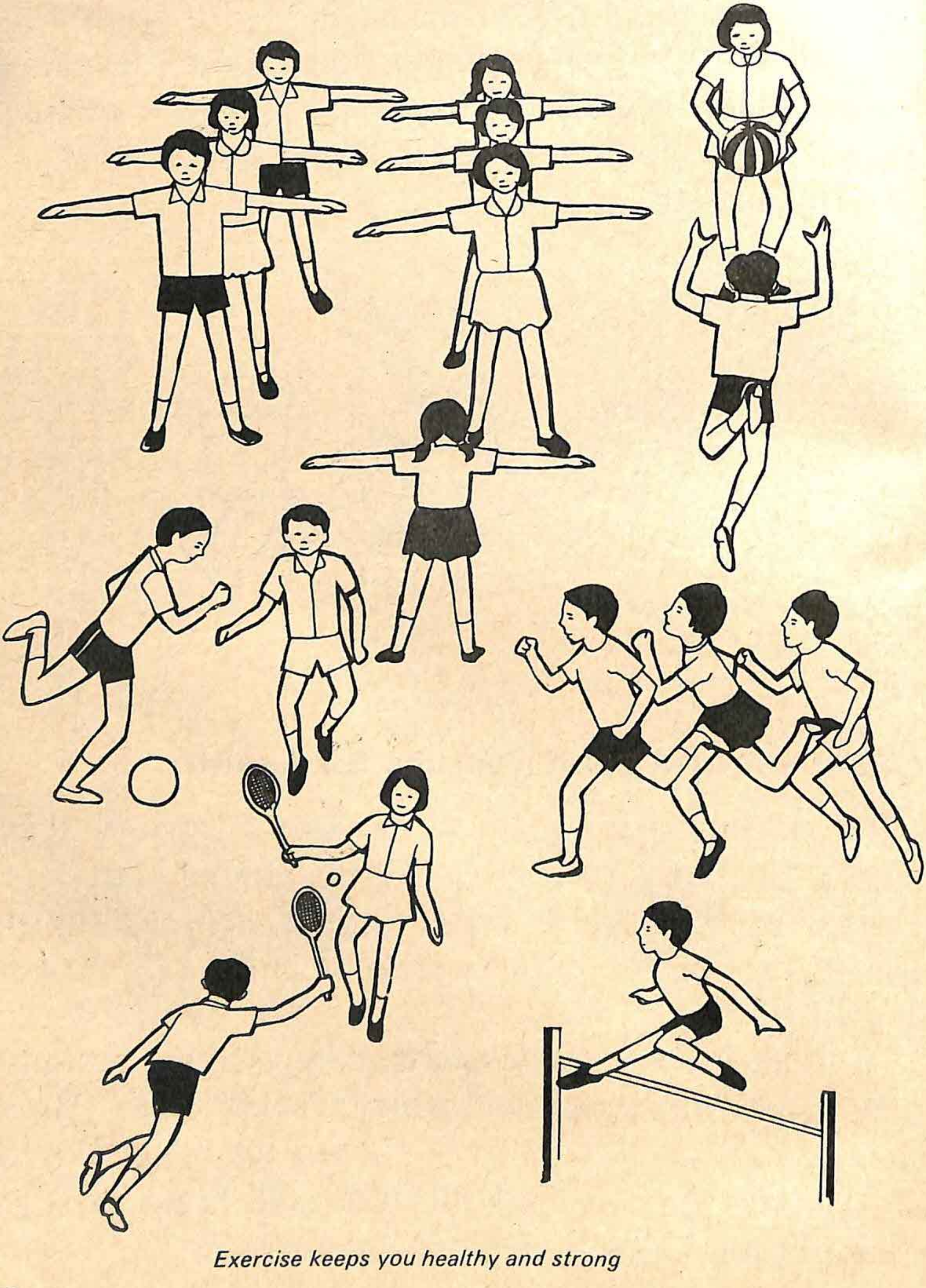


Food for health

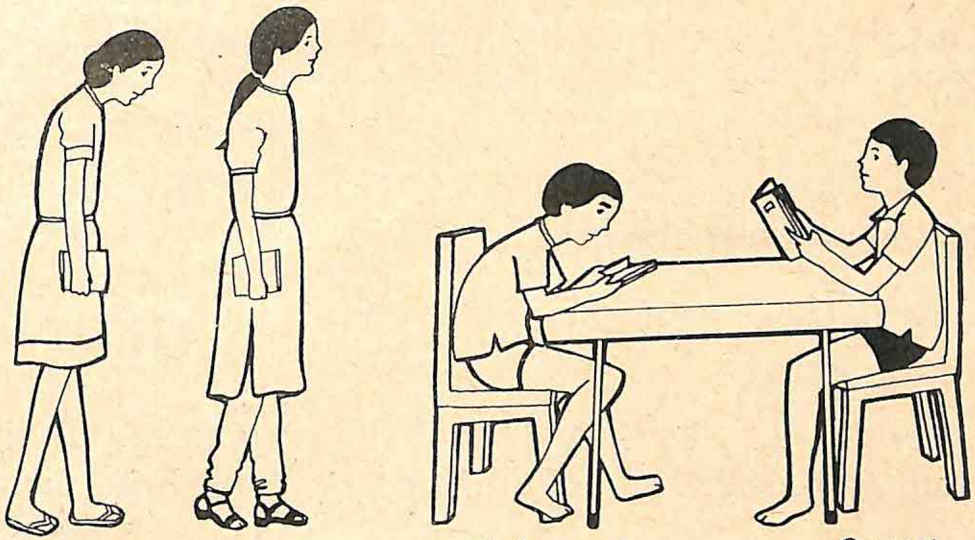
Exercises and good posture for health

If a machine is not made to do work, very soon it gets spoilt. Similarly, the muscles of the human body should be given enough work to keep them healthy and strong. Your body muscles grow stronger with proper exercise.

You need to do simple exercises every day. You must play games which make all your muscles work. After such healthy activity, you feel hungry. You sweat a lot and remove the waste matter from your body. You eat well and sleep well.



Exercise keeps you healthy and strong



Good and bad posture

Not correct *Correct* *Not correct* *Correct*

Posture means the way you sit, the way you stand, the way you walk. Good posture keeps your bones and muscles in proper shape. If you do not sit properly, keeping your back straight, you very soon develop a hunch-back. If you do not stand straight and walk straight, your bones get misshapen. Your body organs fail to do their work properly. You become very slow in your work. You lose appetite. So you grow weaker day by day. With good posture you keep your body organs in their proper positions and help them to be healthy and strong.

Everything clean

We must keep our body clean. We must wear clean clothes. We must eat only cleaned and cooked food stuffs. Raw foods like fruit must be washed and free from mud and germs. We must wash our hands before a meal.

Things to remember

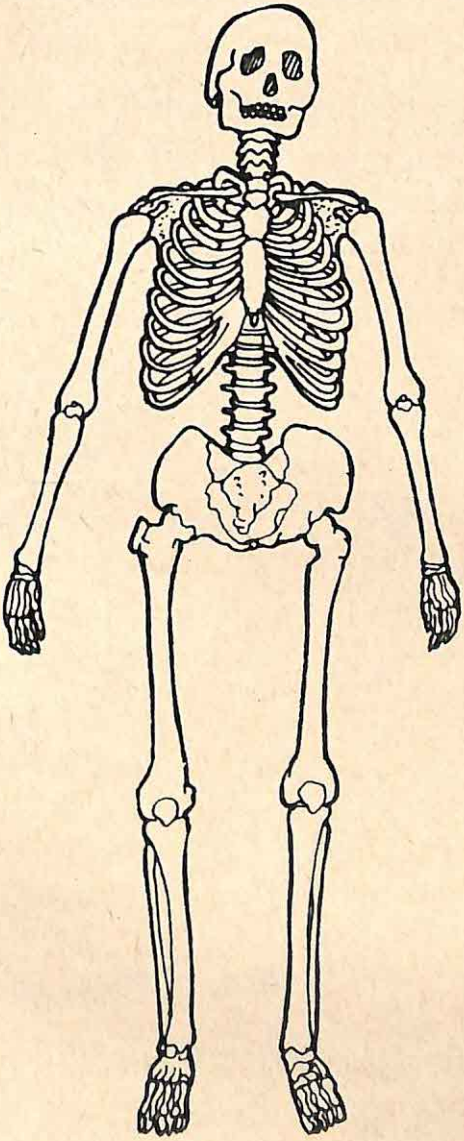
1. We must eat well and sleep well to keep healthy and strong.
2. A balanced meal contains proper proportions of energy-giving, body-building and protective food stuffs.
3. We must do simple exercises every day.
4. We must play games that make all our muscles work.
5. Exercises and good posture keep our bones in proper shape and our muscles active.
6. We must keep everything clean: our body, clothes and home, for healthy living.
7. A healthy body helps you to work well and play well.

Things to do

1. Never neglect your P. T. classes. Learn how to do physical exercises in the proper way. Learn the rules for the games you play. Learn the necessary skill for playing games.
2. Hold yourself in the proper posture, sitting, standing or walking.

3. FOR YOUR CLASS DISPLAY BOARD
   a. Collect pictures of strong and healthy children.
   b. Find a picture of a swimmer or a boxer that shows his well-formed muscles.

4. Look at this picture of a human skeleton. Look at the shapes and sizes of the bones it has. Learn the uses of the various types of bones and muscles.



Exercises

1. Complete the following sentences:
   a. The muscles of our body should be given enough work to keep them ....
   b. Wash your hands clean before ....
   c. If you do not stand or walk straight, ...
   d. Eat enough not ....
   e. Eat a well-balanced ....
   f. The way you sit, the way you stand and the way you walk is called ....

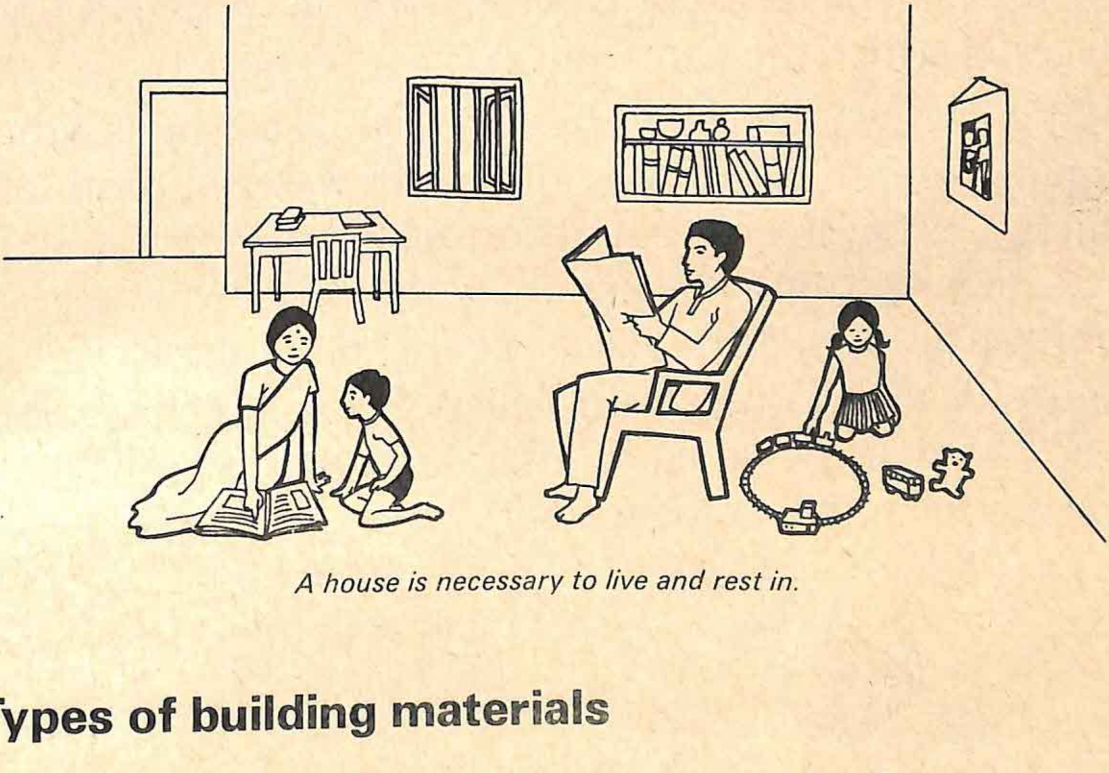
2. Name three types of food you need:
   a. to build up your body;
   b. to give energy to your body to do work;
   c. to protect your body from disease.

3. Why do you need to do exercise? Explain in a sentence or two.

15. Your home and you

Food, clothing and shelter are necessary for life. A clean home helps you to be healthy. A house is necessary to live and rest in. A house is a shelter against bad weather.

We feel happy in a clean house. Do you help your parents to keep your house clean by putting away your books and playthings properly?



A house is necessary to live and rest in.

Types of building materials

Stones, bricks, clay, concrete, cement and mortar are used to build walls for houses. Clay bricks are baked to get fire-clay bricks. Concrete is got by mixing cement and gravel with water. Mortar is got by mixing sand, lime and water in proper proportions.

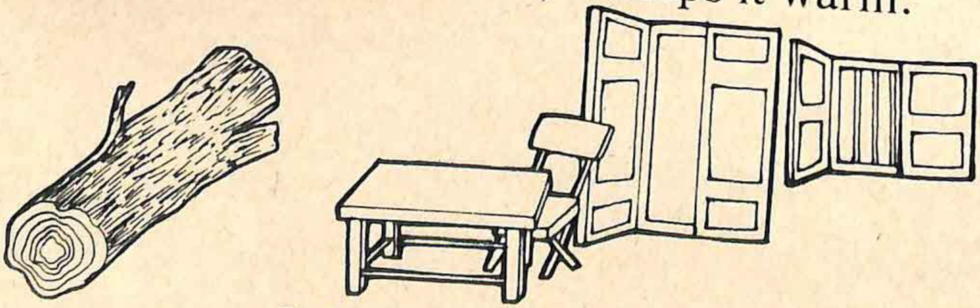
Iron rods, asbestos sheets, wood, bamboo, hay, straw and palm-leaves are also used for building roofs, doors, windows and chimneys.

Timber is used for making doors, windows and furniture. Good timber is waterproof and insect-proof.

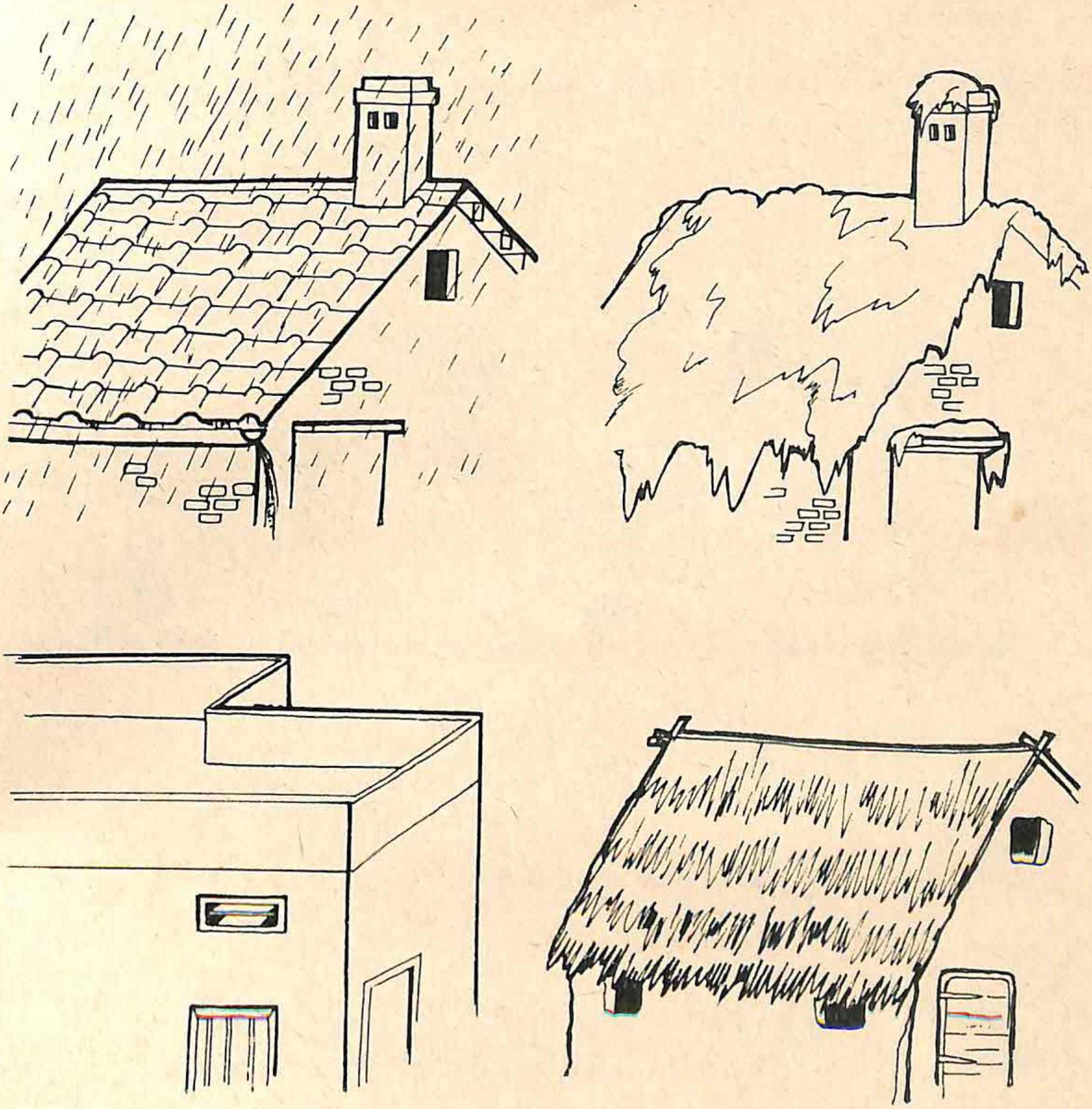
Types of roofs for houses

Houses have different types of roofs according to the places in which they are built.

In places where it rains heavily houses are built with sloping roofs. These roofs allow rain water to drain off quickly. Even in cold countries such roofs are found. They help the snow to slide off without breaking the roof-tops. In hot, dry places, people build brick houses or mud houses with flat roofs. A thatched roof keeps away heat and cold. In hot weather it keeps the house cool and in cold weather, it keeps it warm.



Timber is used for making doors, windows and furniture.

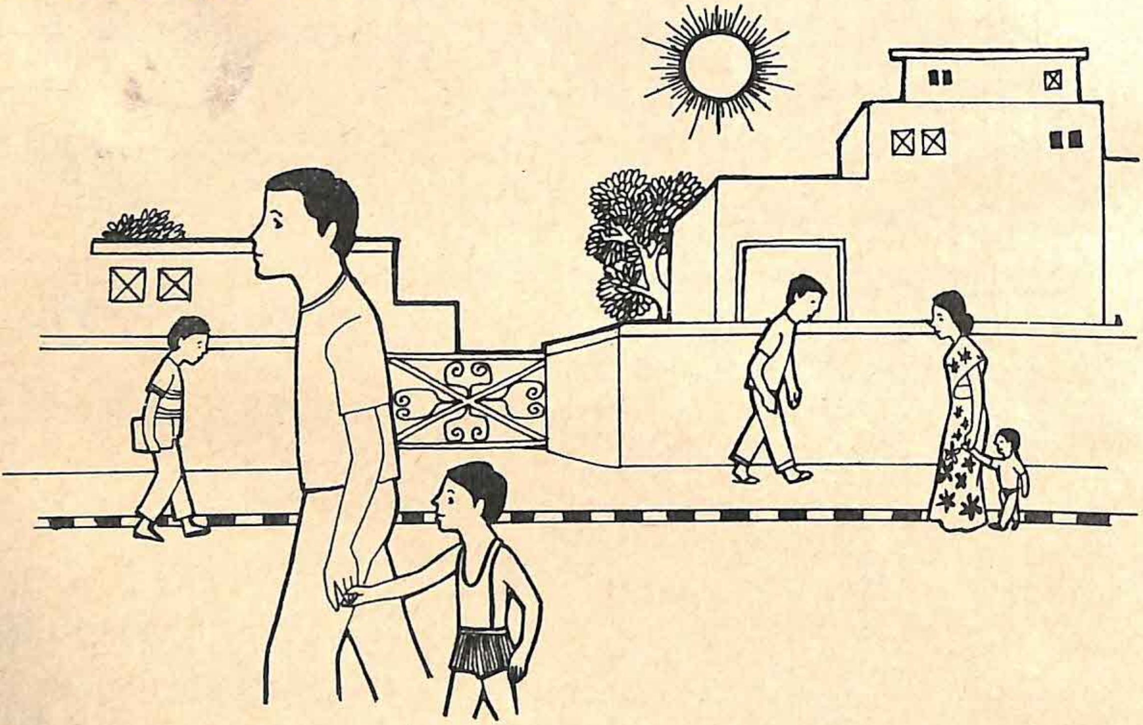


Different types of roofs

Clothing

Just as we need a house to protect us from changing weather conditions, we need clothes to protect our body from heat or cold.

What clothes do you prefer in hot weather? What do you wear in the rainy season? What do you wear in the cold weather?

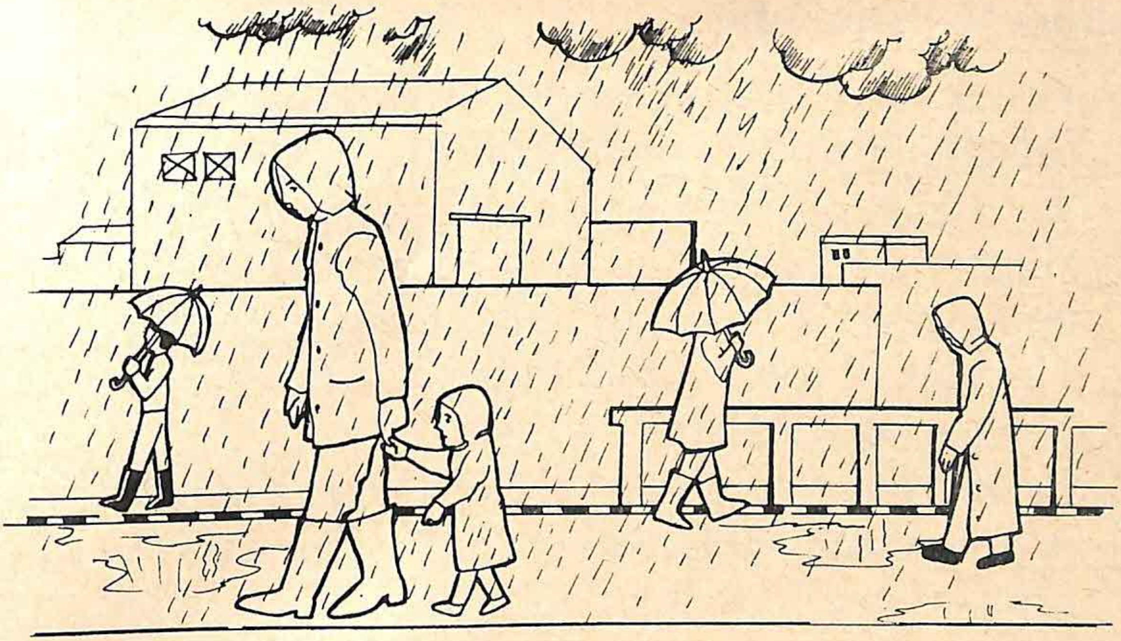


Clothes for a summer day

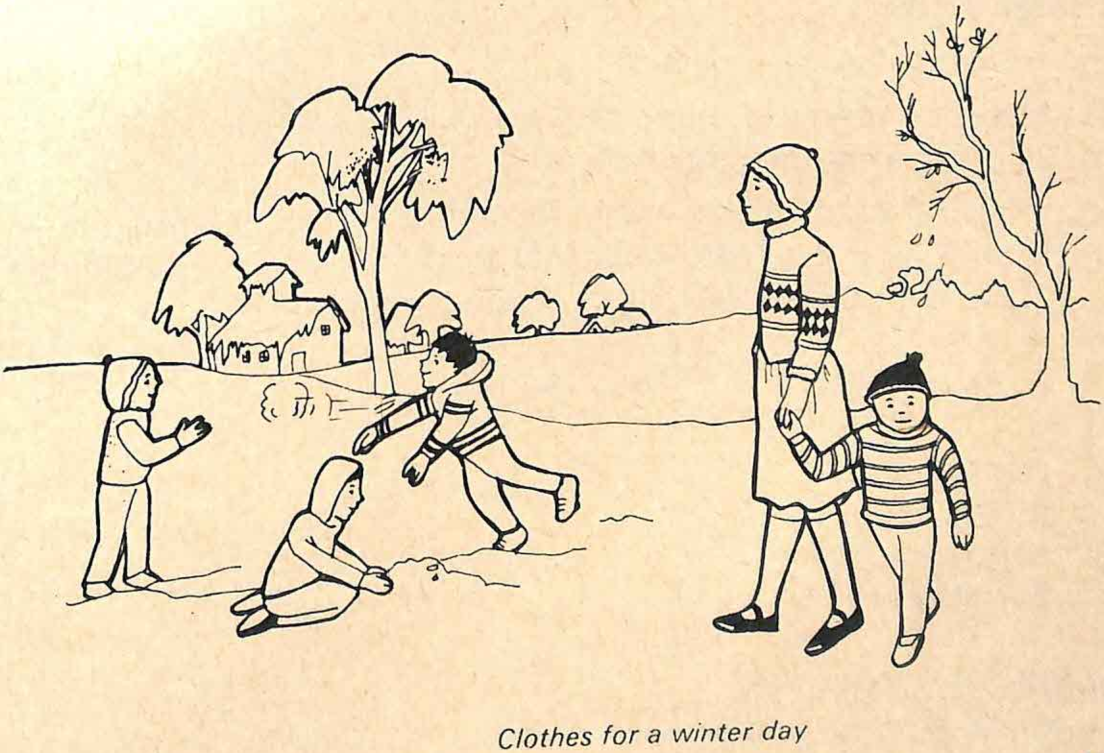
We wear soft, cotton clothes in hot weather. We prefer to wear white clothes in the hot season.

We wear gumboots and raincoats over our clothes in the rainy season. Gumboots and raincoats are waterproof. They are made of rubber or plastic or are coated with waterproof materials.

We wear warm clothes in cold, chilly weather. Silk and woollen clothes keep us warm in the cold weather. Fur coats keep people warm in very cold weather.



Clothes for a rainy day



Clothes for a winter day

Things to remember

1. We need clothing and shelter to protect us from changing weather conditions.
2. We choose our clothes to suit a particular season.
3. What materials we use to build our houses depends upon where we want to build them.
4. The type of roofing should be suited to the climate of a particular place.
5. Even a small house can be kept clean and tidy.
6. A house with enough doors and windows to let in sunlight and fresh air will help us to be healthy.

Things to do

FOR YOUR CLASS DISPLAY BOARD

1. Collect pictures of different types of houses having various types of roofing and building materials.
2. Collect bits of cotton, wool, silk and rubber cloth. Paste them on a cardboard and write when you wear them against each of them. Hang the cardboard from the display board.

Type of cloth	When you wear it
a. cotton	....
b. silk	....
c. wool	....
d. rubber	....

IN YOUR NOTE BOOK

Draw a neat, little house with a nice garden around it. Colour it.

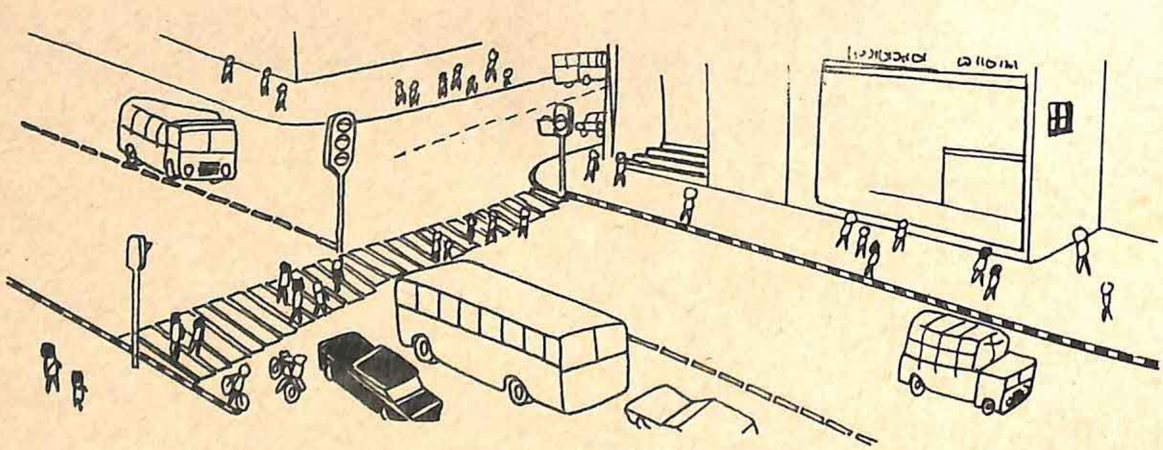
Exercises

1. Write five sentences about your home and your family.
2. Write five sentences about the clothes you would wear in winter.
3. Fill in the blanks:
   a. A house is a shelter against bad weather and .... animals.
   b. By mixing sand, lime and water we get ....
   c. A .... roof is used where it rains heavily.
4. Write a sentence or two to say why we wear white clothes in summer.

16. Road safety

In big cities roads are very busy. Heavy vehicles like buses and trucks as well as cars and motor cycles are driven rashly. Pedestrians and cyclists cut across the road carelessly. Accidents take place. People die or get injured.

Do you go to school on foot, on a cycle or by school bus? In any case, it is necessary to know the traffic rules. Unless we learn the rules, we cannot follow them. For both our safety and the safety of other people we must become good citizens and observe the rules.



Those who drive and those who walk must be aware of road safety.

Do's and dont's for pedestrians

Pedestrians are those who walk on the road.

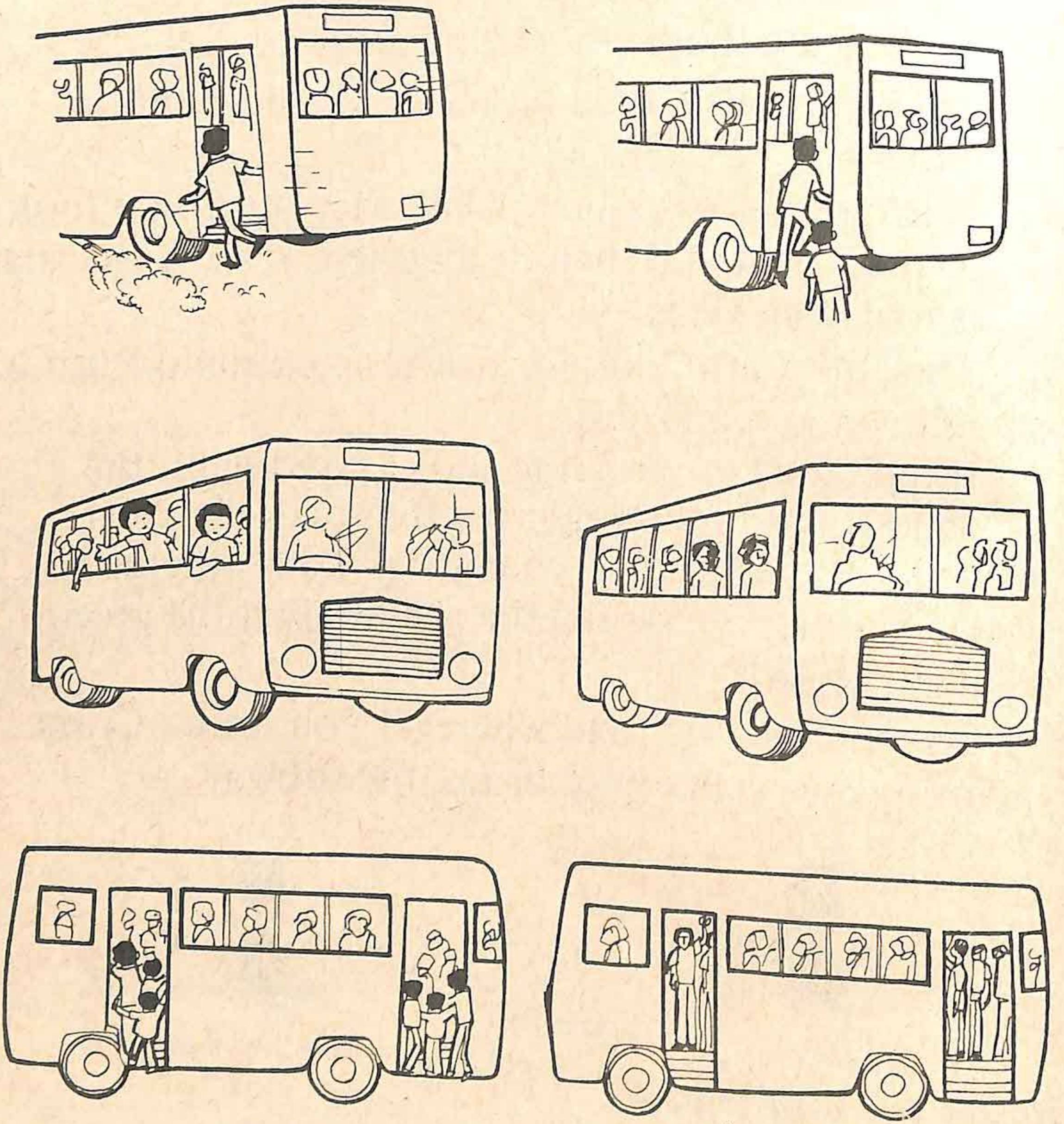
1. They must walk only on the platform, built on either side of the road.
2. When they cross a busy road, they must first look to their right and then to their left to see if the road is free from vehicles.
3. They must also look for traffic signals and learn to follow the road rules.
   If the signal for crossing shows a red light, the pedestrian should not cross the road. He must wait for the signal to change from red to green. He must start crossing the road only if the green light appears.
4. Do not cross the road wherever you want. Cross only at the zebra lines or use the subway.

Red means stop.

Green means go.

Rules for bus travel

1. Stand in line for the bus and wait for your turn to get in.
2. Do not jump into or out of a moving bus.
3. Do not put your hand or head out of the window.
4. Do not travel on the footboard.

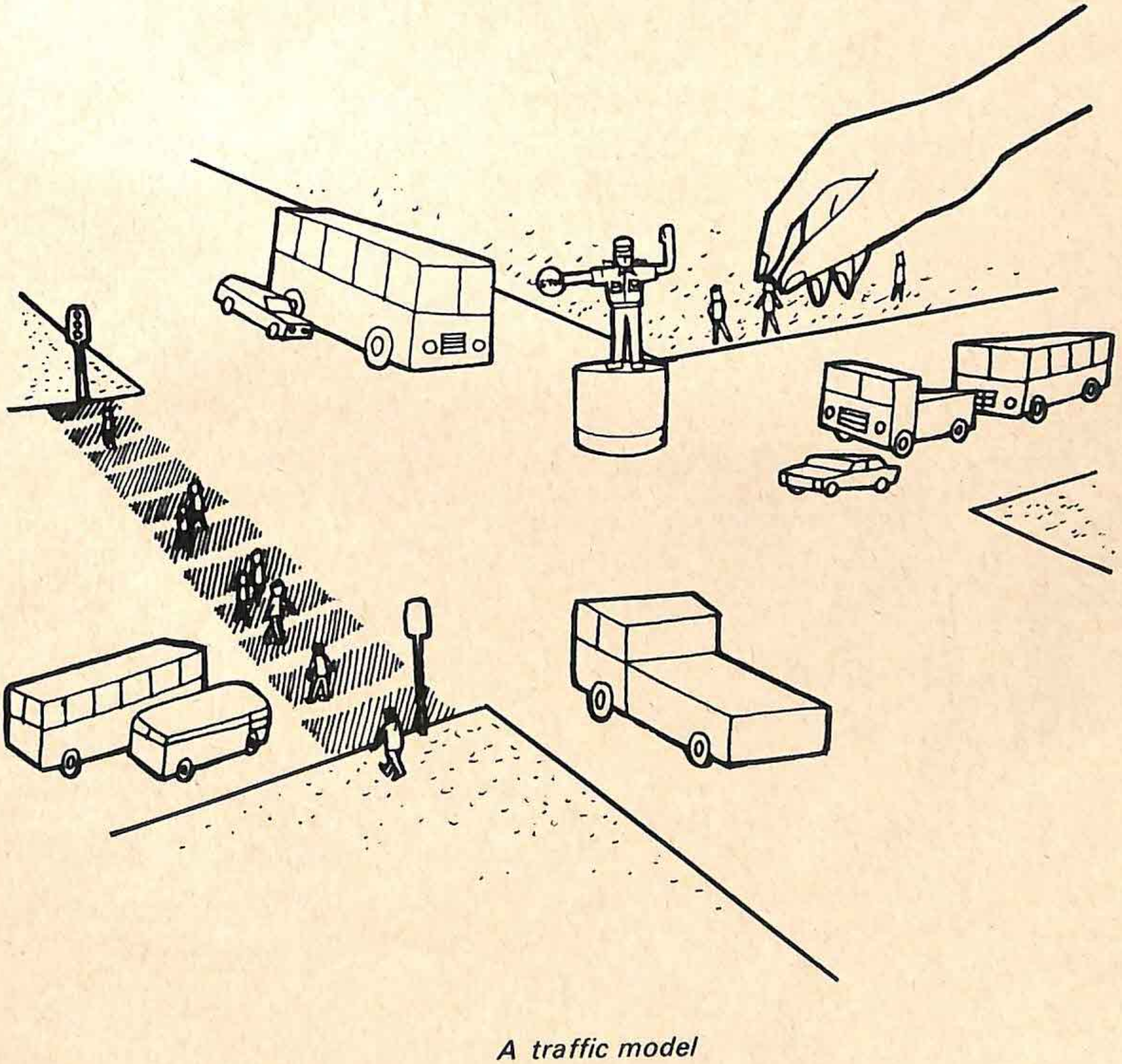


Bus travel: the wrong way and the right way.

Things to do

1. Observe traffic signals on a busy road. See how they change from time to time. See how people obey the traffic signals.

2. Make your own traffic signals using a cardboard and colour papers. Make a road on the window-sill of your class room. Spread sand to show the pavements on either side of the road. Draw and cut some pedestrians and place them on the 'platforms'. Make a traffic island at the junction of four roads. Let a cardboard traffic policeman stand on a dais and control the traffic. Show zebra lines for 'pedestrian crossings'. Cut a few pictures of automobiles with their drivers and passengers and place them on the road facing different directions.



A traffic model

Exercises

1. Write a song on 'Traffic signals' in your note book. Learn to sing the song from your music teacher. Sing it in chorus for your science teacher.
2. Write five sentences to show how you come to school every day.
3. Write five sentences saying why you must follow road rules.

Test Papers

Test paper I

1. a. Name any two plants with broad leaves.
   b. Name two red flowers.
   c. Name two animals with horns and hoofs.
   d. Name two trees with rough bark.
   e. Name two birds which cannot fly.
   f. Name two wild animals which eat both plants and animals as food.

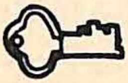
2. Write herb, shrub or tree within brackets for each of the following:
   a. banyan (   )
   b. sunflower (   )
   c. banana (   )
   d. bougainvillea (   )
   e. neem (   )
   f. petunia (   )
   g. jasmine (   )
   h. pine (   )
   i. brinjal (   )

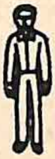
3. Find the odd one out in each group:
   a. cosmos, zinnia, banyan
   b. cow, buffalo, mongoose
   c. zebra, giraffe, lion
   d. teak, mahogany, mango
   e. coffee, cocoa, ginger

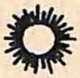
4. What do the following animals eat?
   a. An elephant eats . . . .
   b. A hyena eats . . . .
   c. A cat eats . . . .
   d. A tiger eats . . . .
   e. A crow eats . . . .

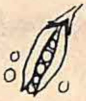
5. Circle only the domestic animals from the following list: rhinoceros, ox, fowl, dog, wolf, rabbit, horse, lion, bear, pig.

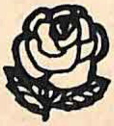
6. Solve the puzzle:

a. don  . . . .

b.  go . . . .

c.  flower . . . .

d.  cock . . . .

e.  wood . . . .

7. Tick the correct word of the two given within brackets for each of the following:

a. A pea plant uses this for climbing. (thorns, tendrils)
b. This flower is also called shoe-flower. (rose, hibiscus)
c. This plant is a flowering herb. (balsam, jasmine)
d. This animal is used for ploughing fields. (ox, goat)
e. We build this home for pigs.(kennel, sty)
f. This animal eats the flesh of dead animals.(jackal, bear)
g. This animal lives in a burrow. (mole, fox)

8. Write short answers to the following questions:
    a. Which animal lives in a burrow?
    b. What does the caterpillar of the silk moth eat?
    c. What is made out of the skin of a crocodile?
    d. Which part of the cabbage and the onion do we eat?
    e. Which tree is shaped like an umbrella?
    f. Which trees do not have branches?
    g. What can you buy in a poultry farm?
    h. Which animal has white spots on its body?
    i. Why do lions and tigers have sharp teeth?
    j. What does the rhinoceros eat?
    k. Which domestic animal is very clean?
    l. Do wild animals build their own homes?

9. Fill in the blanks:
    a. Morning glory, bean and pea need help for .... These plants are ....
    b. Shrubs are .... plants. They have .... stems.
    c. Herbs are short, ... plants. Their .... are soft.
    d. We get .... oil from mustard seeds.
    e. Teak, ... and .... are kinds of .... used for making ...., doors and ....
    f. We get .... from cows and .... from birds like hens, ... and ....
    g. We turn the skin of .... into .... to make shoes, ... and ....
    h. Animals which are .... have sharp teeth for tearing the .... of their ....
    i. .... are the scavengers of the forest.
    j. The .... tree is the biggest in the world.
    k. We tame wild .... to work in temples and in .... carrying ....

10. Explain the terms tree, shrub, herb and climber. Draw one example of each of them.

11. Name ten ways in which plants are useful to us.

12. Name three animals for each of the following:
   a. give us food
   b. give us clothing
   c. work for us

13. Write ten sentences about the feeding habits of wild animals.

Test paper II

1. Write 'useful' or 'harmful' within brackets for each of the following:

a. air ( )
b. storm ( )
c. smoke ( )
d. water ( )
e. dust ( )
f. rain ( )
g. wind ( )

2. Match the following:

Change of water to water vapour
Change of water vapour to water
Change of water to ice
Change of ice to water
Solid form of water

condensation
freezing
evaporation
ice
melting

3. Write the correct word within brackets for the following:

a. Fishermen stretch the sails of their boats when this blows. ( )
b. A windmill is used to pump this. ( )
c. This settles on blades of grass early in the morning. ( )
d. You have made this when you manage to condense steam into drops of water. ( )
e. This comes out of the chimneys in factories. ( )
f. This settles on your books and note books left untouched on a table. ( )

g. Children enjoy flying this on a windy day. (   )
h. This is found everywhere filling vessels and bottles which we think empty. (   )
i. All living things contain this in their body. (   )

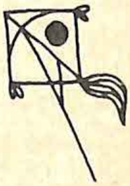
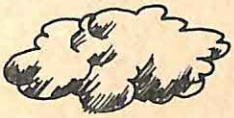
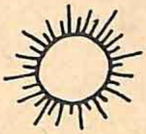
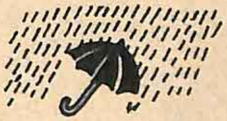
4. Give one word for the following:

a. Moving air. ....
b. A gathering of water vapour with dust and smoke in the sky. ....
c. Wind that blows with speed. ....
d. A huge sheet of fresh water. ....
e. Running water formed out of mountain streams. ....

5. Identify the correct season for the following and write the answer within brackets:

a. Even plants look tired with their drooping leaves. (   )
b. Dark clouds hide the sun and the day becomes dull and gloomy. (   )
c. The sunshine is less warm. Nights become very chill. (   )
d. In cold countries water in ponds becomes ice. (   )
e. We wear light cotton clothes. (   )

6. Identify the weather for the following symbols:

....

7. Write five uses for each of the following:

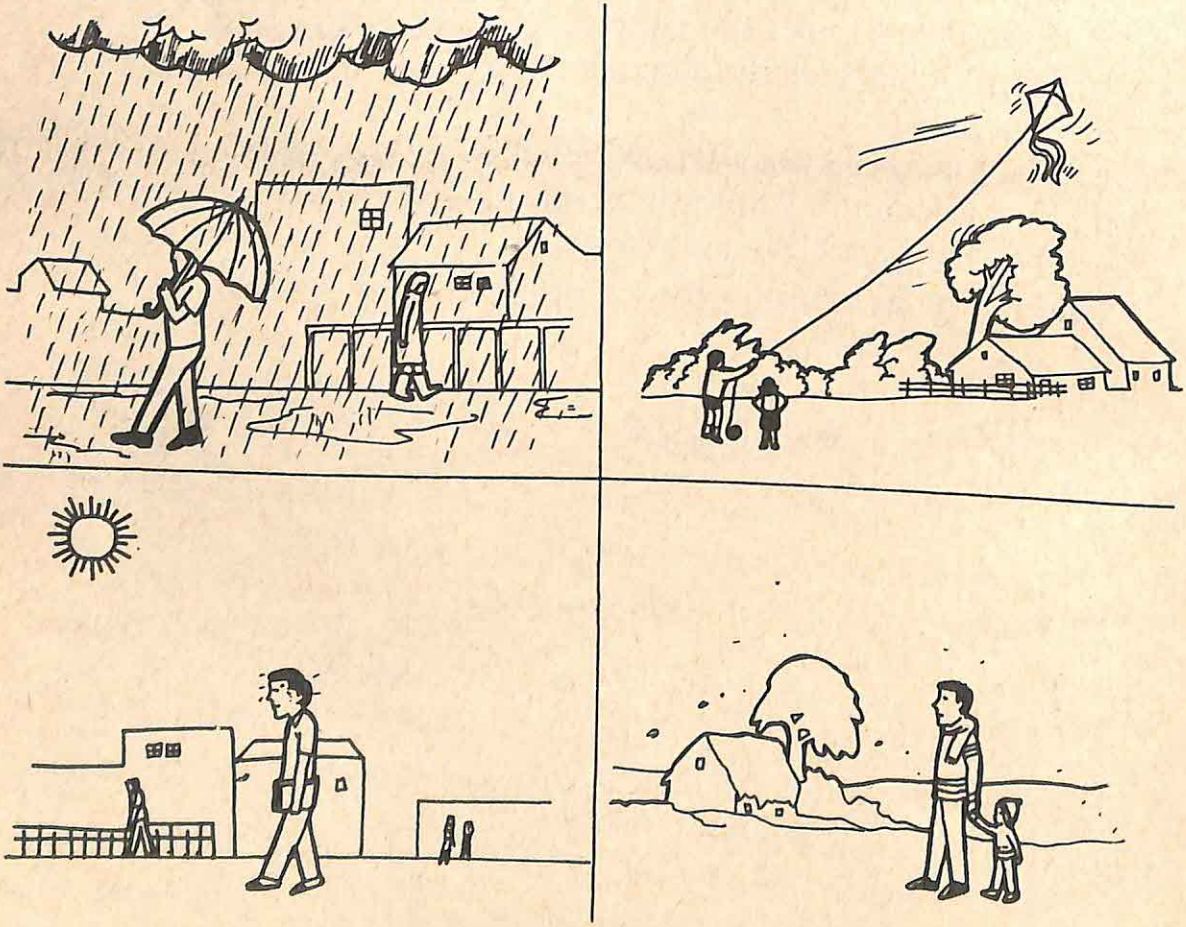
a. wind
b. water

8. Write short answers to the following questions:

a. What is a rain cloud?
b. What is the 'water cycle'?
c. Which season follows summer?

d. How do you feel when you cycle against the direction of the wind?
e. How do you know that leaves and flowers contain water?
f. In which direction do kites and balloons fly?
g. How can you find out that air is everywhere?
h. What is foul air?
i. How do you show that air has dust particles?
j. What is ground water?
k. How do wild animals and plants get water?
l. What causes monsoon winds?

9. What kinds of weather do these pictures show?



Test paper III

1. Join the heavenly body with the names of the days suitably:

Mercury	Tuesday
Venus	Monday
Jupiter	Wednesday
Mars	Friday
Moon	Thursday

2. Can you say why?

a. Mercury is the hottest planet.
b. We are not burnt by the heat of the sun.
c. The sun appears to move across the sky.
d. We cannot see Pluto with the naked eye.
e. Plants die if they are kept in a dark room.
f. Your shadow is long in the morning.
g. Humus floats in water.
h. The sun looks so small although it is much bigger than the earth.
i. The earth and other travellers round the sun are called planets.
j. Rocks were formed.

3. What do we need for the following?

a. To study the planets and the stars. ....
b. To let the shadow of the ceiling fan fall on the wall. ....
c. To walk safely on the road when the road-lights are turned off in the night. ....
d. To grow plants. ....
e. To dry washed clothes quickly. ....

4. Write the correct direction for the following:

a. The sun rises in this direction. ....
b. If you stand facing the rising sun, your back shows this direction ....; your left hand points towards this direction ....; your right hand points towards this direction ....

5. How many moons do the following planets have? Write the number of moons within brackets for each of them.
   - a. Uranus ( )
   - b. Earth ( )
   - c. Jupiter ( )
   - d. Mars ( )
   - e. Saturn ( )
   - f. Mercury ( )
   - g. Neptune ( )

6. Fill in the blanks with suitable words:
   - a. The sun is a ....
   - b. The moon is a natural ....
   - c. Uranus and Neptune are the .... giants.
   - d. Planet means a ....
   - e. .... is the planet nearest to the sun.
   - f. Only planet .... seems to have life on it.
   - g. The sun, the nine planets and their moons form the ....
   - h. It is the earth that .... around the ....

7. Answer the following questions briefly:
   - a. During which time of the day do you find your shadow very short?
   - b. Is a short shadow dark or light in colour?
   - c. When do you get long shadows?
   - d. Can you find your shadow following you on a cloudy day? Why?
   - e. Why do rocks break?
   - f. Which is the smallest particle of soil?
   - g. How does soil support plant life?
   - h. How was the earth formed?
   - i. What does soil contain?
   - j. What is the daily path of the sun?

8. Find the odd one out in each group:
   - a. Uranus, Sun, Pluto
   - b. Star, planet, orbit
   - c. moon, satellite, Mars

d. left, east, north
e. candle light, moonlight, electric light
f. soil, water, rock
g. rain, humus, clay

9. Write yes or no in the brackets:
   a. The sun moves around the earth. (   )
   b. Stars twinkle, but planets blink. (   )
   c. Uranus has five moons. (   )
   d. There are eight planets in the solar system. (   )
   e. Plants can grow without sunlight. (   )
   f. If the sun is behind you, your shadow will also be behind you. (   )
   g. A shadow is formed when something comes in the way of light. (   )
   h. The earth was once a part of the sun. (   )
   i. Sand particles are smaller than clay particles. (   )
   j. Dead and decaying plants and animals form humus. (   )

Test paper IV

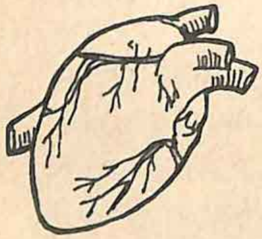
1. Which of the following do the parts of our body resemble? Choose the correct word from the list given below.
   Screw, pump, balloon, camera, mixie, hinge.
   a. lung ....
   b. eye ....
   c. heart ....
   d. stomach ....

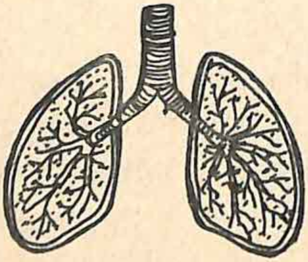
2. What kinds of food are these:
   a. potatoes, bread and rice (   )
   b. green vegetables and fruits (   )
   c. butter, cheese and eggs (   )

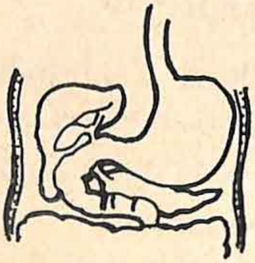
3. Find one word for each of the following:
   - a. This covers up all the parts of the body. . . . . . .
   - b. These form the frame-work of our body. . . . .
   - c. These give proper shape to our body organs. . . . .
   - d. These grind the food we eat. . . . .
   - e. These are like air-filled balloons. . . . .
   - f. This acts like a mixie. . . . .
   - g. This is a muscular pump. . . . .
   - h. This is the fuel for the human machine. . . . .

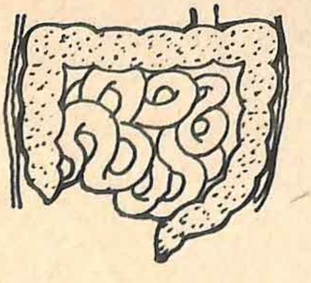
4. Complete the following sentences:
   - a. We move our arms and legs because . . . .
   - b. The small intestine . . . .
   - c. The large intestine throws away . . . .
   - d. We take in fresh air and give out foul air . . . .
   - e. Our body needs proper care for it to be . . . .
   - f. A wise person eats enough but . . . .
   - g. Posture means . . . .
   - h. Raw foods like fruit must be . . . .

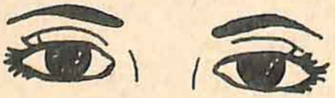
5. Name the following and describe the work they do.

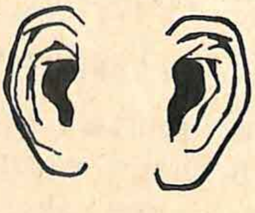












6. Write short answers to the following questions:
   a. How does good posture help you?
   b. What is a balanced diet?
   c. Which organs of our body continue to work from the time of our birth?

7. Match the following:

a. Protective food stuffs	help you to do a lot of work.
b. Body building food stuffs	builds up muscles.
c. Energy giving food stuffs	help you to grow strong.
d. Food is like a	keep away disease germs.
e. Exercise	fuel for the human machine.

Test paper V

1. Circle only the building materials in the list given below:
   timber, cement, silt, bricks, charcoal, rubber, bamboo, palm-leaves, hay, coal, tar, concrete, mortar, glass, firewood.

2. Match the type of roof with the type of weather in a particular region.

a. sloping roof	hot, rainy region
b. flat roof	region with heavy rain or snow fall
c. thatched roof	hot, dry region

3. Match the correct traffic signal with the right activity:

a. green light	Get ready to cross the road.
b. amber light	Do not cross the road now.
c. red light	Now you can cross the road safely.

4. Go round your house and make a list of the building materials used. Copy the list in your note book.

5. Complete the following sentences suitably:
   a. Window panes are made of ....
   b. Sloping roofs are found in ....
   c. Good timber is water proof and ....
   d. Cross the road only at the ....
   e. Car drivers should not ....

6. Write brief answers to the following questions:
   a. How is mortar prepared?
   b. How are hay, straw and palm-leaves used for house building?
   c. Where are iron rods used in your house?
   d. What is the advantage of having a thatched roof?
   e. Why do we have doors and windows in our houses?

7. Who are the persons in this picture who are not following road safety rules? What should they be doing?